Telephony

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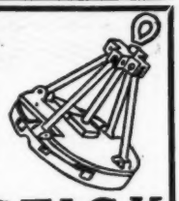

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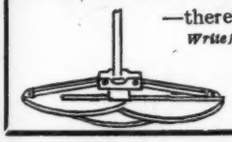

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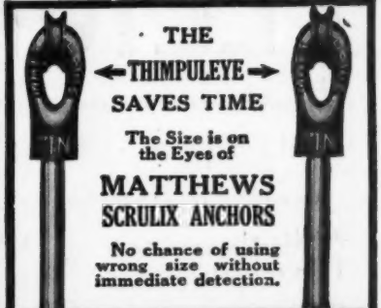

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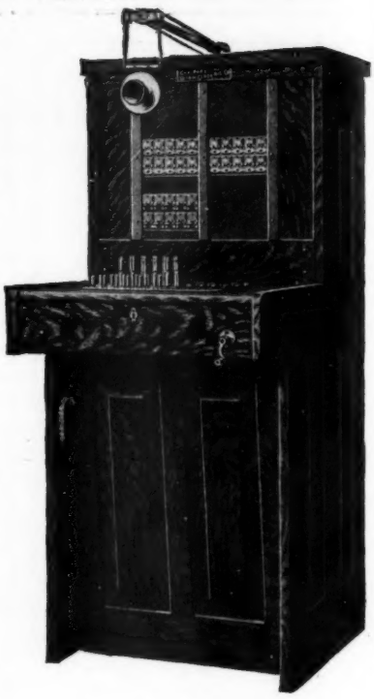

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Telephony.

THE AMERICAN TELEPHONE JOURNAL

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To Get Anywhere.

One can take "a sleeper" after dinner and sleep himself far away to the South for breakfast. So can one sleep himself away any day or any night—to nowhere. To get anywhere worth while, one must take a ticket of preparation and get on the tracks of heart-and-soul effort, hammer and tongs, and thick-and-thin endeavor. Cuddling up in one's snuggery and waiting for something to turn up is futile. You've got to do the turning up yourself.—John Wanamaker.

Newspaper Advertising.

Last week a letter came into TELEPHONY's offices which indicates a need of the smaller companies for assistance along advertising lines. The letter was from Marcus D. Young, manager of the Republican Valley Telephone Co., Franklin, Neb. Mr. Young wrote:

"There is a great demand among the Independent companies for advertising service. Why doesn't TELEPHONY prepare a series of cuts and ready-written advertisements and establish a service from where Independent telephone companies can get attractive cuts to put in their local papers, making an attractive advertisement? We would in turn be willing to pay TELEPHONY an attractive price for its service and return the plates.

We have two weekly papers in this town and I believe it would pay to run a monthly double column advertisement. We believe other companies would appreciate the advantage of this series of advertisements. Local papers have no attractive cuts and as every company's advertisement could read alike, it seems to us like this plan would be a success.

Why doesn't the United States Independent Telephone Association run advertisements in some of the leading journals?"

Readers of TELEPHONY will recall the series on advertising which appeared weekly for a period of over six months. This series, TELEPHONY believes, was a great aid and also a stimulus for better advertising among the Independent telephone companies. While the series aroused great interest and was widely read, there did not seem to be a demand from the smaller companies for the preparation of advertising copy and illustrations, although it was in the mind of TELEPHONY's editor.

Several of the manufacturing companies have had their advertising departments prepare advertisements for publication in newspapers by the local telephone company and this service has been largely availed of. The plates are furnished to telephone companies by the manufacturing companies at cost.

Last fall the directors of the United States Independent Telephone Association considered the question of publishing advertisements in the national magazines, but it was finally decided that the money could be spent to better purpose than in a national publicity campaign. In other words, a full page advertisement in the widely-read and widely-circulated national weekly journals would cost from $5,000 to $8,000 for but one publication, and as the entire funds of the association last year amounted to only $25,000, such a campaign was considered out of the question.

The letter of Mr. Young does, however, raise the question as to whether it would be advisable for the United States Independent Telephone Association to have its service department prepare a series of advertisements for various purposes—cultivation of good will, boosting long distance and toll service and appealing to prospective subscribers.

Should Independent companies really desire a service of this kind, they should lose no time in making their wants known to the officers of the United States Independent Telephone Association.

The plan Mr. Young suggests undoubtedly could be worked out satisfactorily. The cost of preparing a series of newspaper advertisements would not be high provided a sufficient number of companies expressed their intention of making use of such a service.

Successful Management Principles

Campaign of Successful Management for a Telephone Organization in Communities of from 15,000 to 80,000 Inhabitants—Methods Used Which Changed a Run-Down Company into a Prosperous Up-to-the-Minute Going Concern

By Modern Manager

Telephone management of the present day has taken on a never-ending line of complications and in order to be successful one must use extreme caution. The writer, in the following, will endeavor to map out a campaign of successful management for a telephone organization in cities with a population of from 15,000 to 80,000.

We will assume that at the present time there is a local organization which was built in the early days of telephone financing and promotion, with the result that the company now is hardly able to make both ends meet. The board of directors, in desperation, appeals to one of the larger organizations for a man to help them out of this difficulty, and the manager recommended takes the position at a very moderate salary. It is natural that the directors will watch this man and treat him with a skeptical air.

Directors of a Home Company.

Nine cases out of ten, the directors of a home organization are the influential and moneyed men of the community in which they reside. The result is that the telephone business is somewhat of a side issue with them but, being confronted with a possible financial loss, they suddenly wake up to the necessity of watchfulness to protect their investments. The new manager, therefore, has to be doubly careful as to his habits and attention to business in order to win the respect of the board of directors.

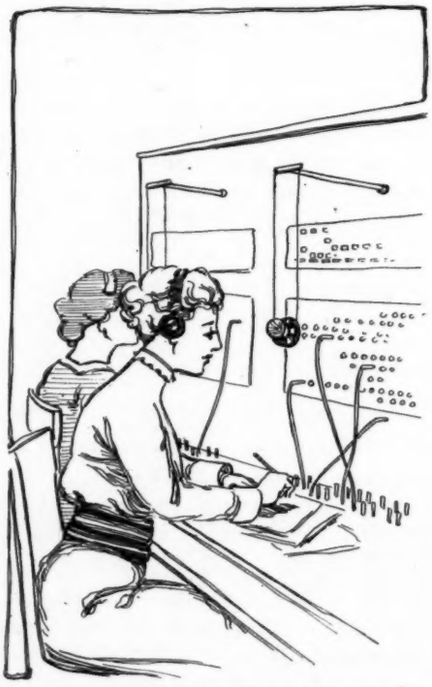
If he is successful in this effort, it will be only a matter of weeks when the directors will give him some sort of a leeway to bring about the improvements necessary to put the service and the plant on a basis of worth.

First Moves of New Manager.

The new manager's first attention should be given to traffic conditions, making a very careful study of the personality and the ability of his operating force and, more especially, the people in charge of this department. He should carefully investigate his peg counts, see that the traffic load is evenly divided and instruct the operating force as to the value of traffic records. He should also impress upon the force that these records are made to help them to be more efficient in their work. Gradually he should educate them along the lines of teamwork and co-operation.

He should have frequent conferences with the chief operators and supervisors. In these talks the main point should be to impress upon these employes the responsibility that they hold and the importance of their position in their relation to the public. He should also be tactful in his effort to show the difference between his position and the various employes in these conferences. This requires a very carefully guarded conversation. In order to get the close cooperation with employes, the word "we" must be paramount.

His next attention should be given to the plant department and a similar course followed with these employes. The plant records should be worked out in such a way that by daily reports the manager can keep in close touch with what is going on in the plant end of the work. There is available at all times nowadays data that the manager can give to his men which will start them along studious lines. This gives him a chance to find out who are the students and who are the most reliable employes in this department.



The New Operator Never Received Specific Instructions in Operating Methods.

The new manager then turns to his commercial department. He should give special attention to the character and personality of those who are in direct contact with the public. He should gradually arrange to have reports presented to him, at least once a week, as to discrepancies, shortages and all troubles that come to those who are collecting and taking care of the business in the commercial office.

In from three to four months, he will gradually have something tangible to work on as to which of the employes should be weeded out and what employes can be educated to the up-to-date methods of the telephone business. In the first months of his administration he should be extremely careful to avoid radical changes. During this time he should have used every means possible to come in contact with as many of the business and prominent men of the community which he is serving.

Manager's Reports to Directors.

In making his reports to the directors, he should use the simplest form possible. There is a tendency of managers in the utility business to work out elaborate, detailed reports. They lose sight of the fact that most of the men who have invested their money in the organization are busy men—all they look for are the general results to see how things are going. However, he should be prepared to have data at hand to answer any detail that these men might want, but to present a mass of figures to a board of directors invariably does more harm than good.

After six or seven months of careful observation along the foregoing lines, the new manager has fairly established himself and is in somewhat of a position to assert himself as to his needs to further the organization.

We will now try to analyze the reason for the rundown condition of the organization when the new manager took charge. An actual condition that came to the writer's notice approximately eight years ago will be cited.

Story of One Company.

It was a city of some 25,000 or 26,000 inhabitants. There were some 1,400 subscribers in this exchange.

The plant and equipment was practically new. A four-section common battery switchboard of the latest type had been installed, together with the latest and most up-to-date protection equipment. The outside plant was a cable distribution system about 1½ years' old and from

casual observance appeared to be in first class condition. Regardless of all this, the people of the community were setting up a miserable howl against the telephone company on account of its poor service.

This company had been promoted in the early days of Independent telephony. Many of my readers will remember the time when telephone promoters were working all over the country. This city seemed to be a choice one on account of the supposed lack of development and the exorbitant rates that were then in force with the Bell organization. The moneyed men of the community became an easy prey and money poured easily into the coffers of the promoters. Incidentally, this was before the days of "public utility laws."

Promoters offered ridiculous propositions to the city council in order to obtain a franchise. They built the plant and started business with rates that would hardly maintain the company. Then they collected their promotion fees, sold their stock to the local owners and left the field.

The local owners had no idea of depreciation, no idea of the extraordinary hazards and knew little or nothing of the prices of material and the possibility of reconstruction. The result was that instead of laying away a reserve for a possible rainy day, they used up all their cash in fancy salaries and dividends.

After three or four years of running along these lines, no dividends were forthcoming, for all the earnings were needed to meet the pay roll, to say nothing of buying new equipment. At the end of six years a reconstruction period began to show up. Outside engineers were brought in to work out the situation.

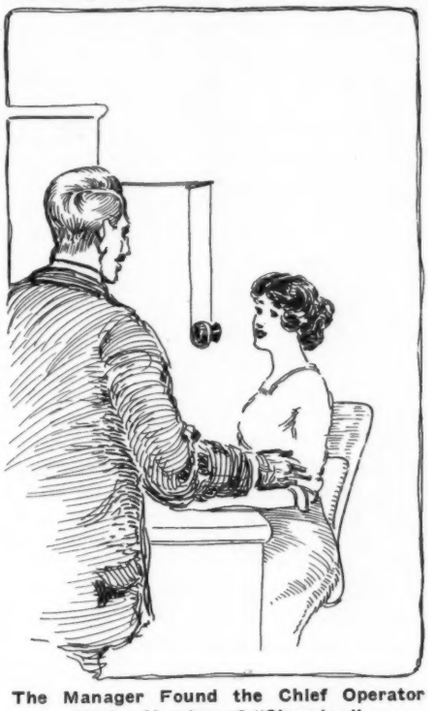
Financing and Reconstruction.

From an engineering standpoint, it was found that several thousand dollars would be needed to meet the growing conditions of the community and to reconstruct the run-down plant. The bankers of the community immediately got to work on a first mortgage and the bonds were disposed of.

Again in a short time came the need of more cash. An increase of stock was issued and sold and that carried them over another year or so. During this time the question of depreciation had never been thought of and the idea of revising rates to meet the growing conditions had never been brought up.

A second mortgage was issued which tided over another lapse of time. At the end of a short time it was found that they could hardly meet their bonded indebtedness and bankruptcy stared them in the face. As was natural on account of the ridiculously low rates, the Bell company was finally driven out of the field and this was considered a wonderful victory for the local fellows.

All this time the same manager had been employed, who had been given full leeway to work out the salvation of the organization. This manager was a good plant man but knew little or nothing of the compiling of rates, depreciation and



The Manager Found the Chief Operator Had a Number of "Chronics."

matters of financial importance. Incidentally, he had not kept himself posted on traffic matters and up-to-date methods of handling a plant such as he was managing at that time. The result was that it wasn't long before the community was up in arms on account of the poor service.

The directors finally in desperation appealed to the public utilities commission which had been created in the meantime, for a raise of rates. The community as a whole went up in the air and an internal row started.

New Manager Secured.

The stock at this time was not worth the paper it was written on. Two or three of the larger financial men of the community finally took the bull by the horns, gathered up as much stock as possible and secured a new manager.

His first work was a rigid investigation into the traffic conditions. He found that the chief operator knew nothing about modern and up-to-date operating methods. The lady in question had been with the exchange since its inception. She had not been encouraged to read and educate herself and keep abreast of the methods of the times but had been left entirely to her own resources.

When the new manager asked the chief operator if she had any operating rules to go by, she replied that she had none—that matter had been left entirely to her own judgment. When a new operator was employed, she never received any specific instructions as to operating methods. She was placed alongside another operator and was left to grasp the situation as best she could.

Traffic Improvements.

The manager's attention was next turned to the grouping of the lines on the switchboard. He found that nearly all the important lines, or the lines that were used the most, were grouped in two positions. These lines were handled by two of the oldest operators, who knew almost everybody answering those telephones personally. The residence lines, or the less important lines, were scattered promiscuously over the remaining positions.

He also found several operators sitting at the board with nothing to do. It was learned that, on account of not having made any traffic study, the chief operator assumed it was necessary to have all positions filled during the entire day from 7 o'clock in the morning until 9 o'clock in the evening, when two night operators took the board. The operators were working in regular stated shifts and at a signal from the chief operator one group left and another group took their places.

The chief operator told the manager that as the operators became more and more efficient they were advanced a chair towards the business section. It was generally known in the operating room that the business men sent presents to those operators and it was natural for the girls to try to get to the business sections of the board. This was one of the mediums used as an expedient to make the operator ambitious to become more efficient.

Inquiry was made of the chief operator as to her trouble tickets. He learned that no regular trouble slips were made. All she did was to make a note on a slip of paper and take it out to the wire chief.

While observing the work of the chief operator, the manager noticed that she answered several complaints for which no slips were made. The answer to his inquiry, as to why no slips were made, was: "Oh, he always grumbles. We know him so well, there is no need to send a man up there."

In other words, he was one of the "chronics." In a short time the manager found that the chief operator had a large number of "chronics."

After three days of observation on the part of the manager, traffic conferences were started. A set of operating rules and regulations was put into the hands of the chief operator. Bi-weekly meetings of the operating force were held and the importance of their relation to the public was brought very forcibly to their notice.

Peg counts were made and a careful record of each operator's load was taken. Lines were regrouped and the word "chronic" was made a forbidden term in the exchange.

The result of these activities was that in four months, complaints were reduced from 40 to an average of four per day, and the pay roll in the traffic department was cut down 30 per cent.

Plant Department Methods.

While this was going on, the manager worked along similar lines in the plant department. Conditions there were found very lax. The average time for clearing a trouble when the new manager took charge was some three hours. He discovered that the wire chief and his two troublemen did not realize the necessity of being in a hurry to clear a trouble. If a trouble wasn't cleared today, it was taken care of tomorrow.

From a conference with the wire chief, it was learned that he didn't think it necessary to look up troubles in the terminal room and the switchboard because they had plenty of extra lines. Rather than take a chance of disturbing conditions, he thought it best to cut them over to a new line and then later an appeal to the firm that installed the terminal and switchboard to come and clear the troubles.

A test of the working lines showed that in the 12 months the new switchboard and terminal equipment had been in service, some 45 minor troubles had shown up and this meant that 45 of the lines were out of service.

The wire chief informed the manager that when he had 75 or 100 troubles he was going to recommend that the firm which installed the equipment be called upon to clear them.

By delving into the situation further, it was found that the two troublemen and the wire chief were carrying on a little side line, which was considerably enhancing their income every month. The wire chief, himself, seemed to be enjoying his pipe immensely while at work at the test desk and took pleasure in frequent conversations with his friends in and around town.

No specific record had been kept of the troubles, apart from the little scraps of paper brought to him by the chief operator. He was very much surprised when the manager laid before him a daily trouble report in printed form and demanded to know of a reported trouble, when the troubleman started and when it was cleared. He wasn't aware of the scheme put in practice in the operating room as a check against him. Several days later, when he was asked to a joint conference with the chief operator, he made the remark that he didn't see the necessity of such extreme care, because the people in the community had not been schooled to a better class of service.

After three months of the new regime in the maintenance department, the wire chief could not stand it longer and tendered his resignation. At the end of five months, instead of having three men in this department, the wire chief and one troubleman handled the situation, and the average time for clearing trouble was reduced to about 15 minutes.

The Wire Chief Took Pleasure in Frequent Conversations with Friends.

Reformation of Line Gang.

The line crew was also being investigated during this time. The man who had been employed as city foreman had three men under him with a horse and wagon.

The idea of soldering a connection had never appealed to the city foreman. No standardized methods had been put in practice in the installation of new subscribers. The whole matter took on a hit-and-miss situation. The city foreman had formed a habit of coming to work in the morning, looking over the orders for the day and leaving his men to carry them out. Then he attended to little side lines in the city, in which he was interested.

Supervision in the construction crew was not considered necessary. The inspection of the terminal boxes around the city showed that very little care had been taken in making connections. Instead of cleaning carbons and replacing them, they were left out; in a great number of instances fuses had been taken out and replaced by copper wire, resulting in cable injury due to lightning and heavy currents. Inasmuch as the plant was practically new and many conductors were available, instead of trying to locate the trouble it was just merely a case of putting the subscribers on another pair of conductors.

No matter what the new manager could do, this city foreman proved to be a hopeless case. He would not study and would not listen to reason. It is needless to state that his resignation was asked for and the new man put in his place.

Stock Room Management.

The next problem to receive consideration of the new manager was the material stock. The method in force was that when the wire chief or city foreman ran out of any material, they would rush to the manager and have orders made out to have the material sent along. No check system had been used. The result was that when the inventory was taken shortly after the new manager took charge, there were found piles of material stored away.

In chatting with one of the directors in a general way, the question of material stock came up. It appeared the old manager had an idea that he would keep the junk and watch the stock market, believing by doing so that he would enhance the company's coffers somewhat. Perhaps the reader will be surprised when he reads that the selling of junk in this exchange after four months of the new administration netted some $4,000. This included old cable, old instruments, copper wire, broken tools and accumulations of many years. The old administration had forgotten all about the stock market.

No such a thing as a material stock-book had ever been thought of. In a short time bins were built, stock cards were placed upon the bins, the stock was all classified and a new stock record was made. A monthly inventory was instituted with the result that a tremendous saving was made on material and equipment alone.

Business Office Methods.

The commercial department came in for the next rigid investigation. This department consisted of a young man as cashier, a young woman as bookkeeper and a toll attendant. The cashier was also the collector.

A discount system had been put in force a year or so previous to the advent of the new manager, so that the majority of the accounts were brought in on or before the 16th of the month, and by the 19th of the month the cashier had his books pretty well posted. His duties from that time on were to go out and collect the delinquent accounts.

After the first month's work, the cashier stepped into the manager's office and presented a bill for some $8. This money was spent by him in an endeavor to collect the delinquent accounts. He stated that it was absolutely necessary to have a spending account to help him in the furtherance of his work. He was a much surprised man when the new manager informed him that no allowance like that could be permitted. Immediately friction developed in the commercial department against the new manager.

The three individuals in that department connived to show up the supposed reformer. However, the manager was equal to the task and, knowing the possibilities of the lax conditions of the bookkeeping department, talked with the president to the end that an outside auditor was called into the office.

A careful check of the subscribers' ledger revealed that there were some 38 telephones installed for which no rent was being received. A search was made through all records that were at hand with the thought that possibly these subscribers had been overlooked, but nothing was forthcoming.

It was learned that the discount question was a very hit-and-miss proposition. The question of enforcing the discount had been left entirely in the hands of the young cashier. Occasionally a disgruntled situation was brought before the manager and the discount was enforced.

A comparison of the stubs that were on file and the cash book showed that by far the greater percentage of the people who paid after the discount day were not penalized. As is usual in nearly all smaller communities, the question of relations and close friends was brought into play and the strict business methods of today's public utilities were overlooked entirely.

The new manager on two or three different occasions was called before the directors on account of his supposed severity. One of the directors especially mentioned that the employes in the commercial department had informed him that the manager had made threats to clean the whole outfit out. The new manager was again equal to the situation. By a careful, detailed report he laid before them the actual condition that existed.

Conferences with Employes.

It was not long, however, before these three employes in the commercial department realized that the new manager knew something about the telephone business and how it should be handled. Instead of making things unpleasant for him they gradually came around to his way of thinking and were glad to receive any information that would better their condition.

Harmony was thus brought into effect throughout the entire office.

Besides the departmental conferences previously mentioned, a monthly general meeting was held and kept up regularly for some two years. After a time the manager did not think it necessary to have a general meeting once a month, so he decided to have the chief operator, wire chief, city foreman and chief clerk in his office at least once a week, from one-half to one hour, to talk over general conditions. This has been kept up fairly well ever since.

In the foregoing the writer has endeavored to demonstrate an actual condition of telephone exchange management. His position at the present time is such that he has been called into conference on several different occasions with many cases such as cited.

While perhaps not so severe, the fact still remains that there are many of our telephone industries which are in need of close supervision. Unfortunately, in the Independent field and more especially in locally-owned plants, the directors of the organizations forget the importance of their investment to the community and are somewhat lax in their supervision. Instead of instituting methods to prevent disaster they wait until the disaster occurs before trying to rectify the wrong.

The telephone wrecks all over the United States are just brought about by the issue being treated as a side line. It is a pleasure to note, however, that conditions are rapidly changing and the spirit of Independence is more and more apparent. The time is at hand when the locally-owned plant will be as well managed as any of the larger organizations of the present day.

The City Foreman Left His Men to Carry Out the Orders.

Joplin Home Company's Good Operators' Record.

The treatment of its operators by the Joplin, Mo., Home Telephone Co., is good and its operators answer calls on an average of 4¼ seconds, according to a report recently filed with the city commission of Joplin by J. F. Lee, commissioner of public utilities. Mr. Lee made a supplementary report that was accepted by the council. Mr. Lee's supplementary statement follows:

"The telephone company gives its operators one week's vacation with full pay the first year, and ten days' vacation each year after the first. It requires from 180 to 230 calls an hour from its operators. I have tested and have had tested, 233 calls and the average time of the calls was 4¼ seconds. The longest call that was reported to me was 11 seconds, and the shortest call was 1½ seconds.

I have talked with seven operators, four of whom have been in the employ of the company more than three years, and three who have been with the company one year or less. None of them says she is overworked. One operator says that 201 calls in an hour is the highest number of calls that she has a record of answering.

Another operator says that she has often answered 250 calls in an hour and that she could answer 300 calls in an hour and give good service. This operator has never worked in any other telephone exchange, but has visited the Kansas City exchange and does not believe the girls are worked any harder in Joplin than in Kansas City. One girl says she has to answer only 125 calls an hour, and that 125 calls is all that she can make and give good service. She is on the rural route. Another operator tells me that sometimes she has more calls than she can answer, but at that time the supervisor assists her.

The salaries that the operators receive the first year are $24 a month and the second year $33 a month.

There has been some complaint about the difference in the prices of a single line over a mile from the office, as the charges are 25 cents more for a single line over that distance. Some persons believe they are discriminated against when their neighbors across the street get cheaper service than they can get, for the same rate is given to persons on a party line. The company claims to have this rate filed with the public service commission, and claims it has the right to charge it."

Kentucky Operators Study U. S. Long Distance Rules.

At the meeting of the operators of the various exchanges of the Central Home Telephone & Telegraph Co., the new rules on long distance operating practices were under discussion. Since the adoption of these rules by the United States Independent Telephone Association, they have been up for consideration at all of the meetings.

It is the practice to assign two or more of the paragraphs to each girl attending the meeting and then to have her read and discuss them. It has been found that the girls are very much interested in this manner of taking up the subject.

Fundamental Principles of the Telephone Business

A Reading Course Designed to Present Logically the Principles Which Underlie Successful Organization and Operation of Telephone Properties—Prepared Under the General Supervision of Stanley R. Edwards—This Section, "Part VI, The Valuation of Telephone Properties," Written by Chas. W. McKay

Quiz Questions on the Preceding Installment.

122. What is the general attitude of courts and commissions relative to going value?

123. What is usually necessary in financing public utility properties? Into what two general classes is the cost of financing divided?

124. How is money secured to start an enterprise?

125. Outline the steps and the expenses in securing permanent capital.

126. Outline the attitude of courts and commissions regarding financing cost in ascertaining reproduction cost.

127. Illustrate the method of computing the cost of financing.

CHAPTER VI. The Non-Physical Assets (Concluded).

128. *The Computation of the Permanent Financing.*—The plan of permanent financing contemplates the issuance of permanent securities as an evidence of the total investment in the property. Whether these securities would be in stock, in bonds, or partly in each, is immaterial.

A study of the bonds authorized by the railroad commission of this state, covering light, power, gas, water and telephone properties during 1913 and 1914, shows that the 5 per cent. bonds, aggregating $21,468,000, were sold to net 88.25 per cent. of their par value, and that the 6 per cent. bonds, aggregating $8,359,200, were sold to net 91.25 of their par value. Based on this showing, we have assumed that the securities covering this property could be sold to net 90 per cent, of their par value.

The cost of permanent financing will be as follows:

Total value of plant, consisting of all items down to and including construction in process (Table IV)	$ 8,592,475
Cost of establishing the business	2,292,954
Working capital	221,513
Cost of financing during construction	190,888
Total amount to be financed at 9 per cent of par value	$11,297,830
Discount, or cost of permanent financing	1,255,314
Total securities issued	$12,553,144
Cost of permanent financing	$ 1,255,314

This means that, in order to raise the total amount invested in the property at the time of its permanent financing, $11,297,830, it would be necessary to issue $12,553,144 worth of securities, representing a cost of permanent financing of $1,255,314.

129. *The Total Cost of Financing.*—The total cost of financing, therefore, will be made up of:

Cost of financing during construction	$ 190,888
Cost of permanent financing	1,255,314
Total cost of financing	$1,446,202

In a very general way, all of the elements component to the total reproduction cost of a telephone property have been discussed. Many of the illustrations of methods of computing the items of collateral cost and the tangible values have been taken from actual appraisals. Rather than complicate the text by an attempt to outline all of the possible methods which might be, or have been, used, the writer has, in each case, selected for consideration what seemed to him the clearest and most plausible method and the one which has had the most favorable consideration at the hands of courts and commissions.

CHAPTER VII. Preliminary Steps and Real Estate.

130. *Preliminary Steps of the Inventory.*—In considering the various steps involved in the actual preparation of an appraisal, it is well to imagine oneself in the position of an engineer about to undertake an appraisement problem. There is such a vast amount of detail involved in the appraisal of even the smallest telephone property, and so many different angles from which the problem may be viewed, that too much stress cannot be laid upon the importance of thinking out each step most carefully in advance.

As a matter of fact, it is impossible to lay down any specific set of rules adequate to meet the individual requirements of every appraisement problem. In the last analysis, success inevitably depends upon the experience, good judgment and integrity of the men in charge.

Appraisals cannot be made by novices, no matter how capable they may be or how carefully they may have studied up on the subject in hand. Problems are constantly arising both in the taking of the inventory and in the appraisement that require the experienced supervision of men who are familiar with every angle of the appraisement game. In sketching a general plan of procedure, therefore, an effort will be made to treat the subject broadly and to obviate confusing detail.

There are certain preliminary steps which have to be gone through in advance of the actual appraisement of almost any telephone property, and these may be summarized as follows:

1. Determination of purpose of appraisement—whether for rate adjustment, financing or accounting purposes.
2. Survey of conditions by engineer in charge.
3. Investigation of company's records by engineer in charge.
4. Review of state or local commission instructions governing the preparation of appraisals.
5. Preparation of field forms—determination of types of construction involved, etc.
6. Selection of field inspectors, office help, etc.

131. *Determination of Purpose of Appraisal.*—There are several purposes for which telephone appraisals may be required and the method of appraisement—at least insofar as refinement of detail is concerned—is necessarily dependent upon the ultimate use to which the appraisal is to be put. The various uses may be summarized as follows:

1. Appraisals for presentation before regulatory bodies in rate adjustment cases.
2. Appraisals for the purpose of determining the fair value for use in financing.
3. Appraisals for use as a basis of tax adjustment.
4. Appraisals for accounting purposes.

The first question that confronts the appraisal engineer, therefore, is: "What are they going to use this appraisal for?"

If it is for any of the last three purposes, much of the detail necessary for a commission appraisal may be eliminated. The reason for this is obvious. The various state commissions must of a necessity insist upon a strict adherence to carefully formulated rules as to form of appraisal, classification of materials, grouping of summaries, etc., otherwise they would continually be overwhelmed with a heterogenous assortment of data difficult to assimilate and of practically no use to anyone except the people who prepared it.

132. *Survey of Conditions.*—Having ascertained the use to which the prospective appraisal will be put, the engineer can start the preparatory work in earnest. First will come a general inspection of the property in the company of some official or employe who is thoroughly familiar, not only with the geographical layout of the plant, but also with the construction history of the various portions

If the property is a large one, the inspection will necessarily be limited to a small proportion of the total. In this event a special effort should be made to cover sections that are typical of the various kinds of construction used throughout the plant as a whole.

The importance of this preliminary inspection trip cannot be exaggerated. It gives the engineer an idea—invaluable in his later work—of the correlation of the various parts of the property. It furnishes an index to the present plant conditions—and this alone is worth the time involved. It paves the way for an intelligent unit cost study by affording an opportunity to observe general topographical and soil conditions as well as railroad shipping facilities. Last but not least, a preliminary inspection trip affords a basis for an intelligent estimate of the cost of appraisement.

133. *Investigation of Company's Records.*—After the preliminary inspection trip comes the review of the company's records and map files. It is most important at the outset to ascertain the exact condition of the records and find out just how far they can be relied upon as an aid to the preparation of the inventory.

If the records are reasonably accurate, they can often be used as a general check on the field work. Of course, it is unwise for a disinterested engineer to put too much faith in the company's records—if the appraisal is being made for commission purposes and he is to be required to substantiate the inventory on the witness stand—but a comparison of the company's records with the field notes may be invaluable in pointing out doubtful items which should be rechecked in the field.

Maps of the outside plant layout should be gone over carefully with a view to determining their possible usefulness in connection with the field work. Nothing helps so much in an inventory of the outside plant of a telephone company as a good set of plans showing the location of the pole, aerial cable and underground systems.

The use of such maps will obviate loss of time on the part of the field men in finding and identifying the company's property.

134. *Review of State or Local Commission Instructions.*—If the appraisal is for presentation before a commission, or if there is the slightest possibility of its ever being put to that use, the greatest care should be taken to see that the appraisal conforms to commission requirements in every detail.

A careful study by the appraisal engineer of all available instructive literature issued by the commission may obviate subsequent needless expenditures of time and money in rearranging the data. Of course, if the appraisal is not to be used for commission purposes, the engineer may use his judgment as to form of presentation. Even in this case, though, it is best to adhere strictly to the accounting instructions of the Interstate Commerce Commission.

(To be continued)

Association Membership—An Intangible Asset Capitalized

By S. M. Heller

Membership in the United States Independent Telephone Association is an intangible asset which every Independent telephone company should capitalize by becoming a member of the association.

The need of concerted action in every line of business is apparent to even the most casual observer and is evidenced by the fact that every line of business has its state and national organizations. It is only by co-operation that big things can be accomplished. That which benefits a business as a whole is of value to every individual unit of that business. Experience has proved it true.

The United States Independent Telephone Association is a clearing house for all questions affecting the Independent telephone business. If a member company is confronted with a problem in any department of its business—engineering, commercial, traffic or general—a single letter to association headquarters will bring information which scarcely could be bought, based upon the experience of companies which have met and solved the same or similar problems.

The association maintains offices in Washington, D. C., and Chicago, Ill., with trained telephone men in charge, who are constantly at work for the good of Independent telephony. The results of their work are as valuable to the non-member company as to the member company of the association and every Independent telephone company should, therefore, consider it not only a duty but a privilege to help further this work by becoming a member of the association.

S. M. Heller.

North Dakota Telephone Men Discuss Uniform Accounting.

Uniform accounting systems for Independent companies was the topic of discussion at a conference held in Fargo, on March 23, between a number of exchange managers from various parts of the state, and Ole Aandahl, a member of the state railroad commission.

The discussion centered around a proposed state supervised system for telephone companies, to be installed and checked by the state in the manner used by the federal government for elevator and grain houses.

Another feature of the work taken up was the holding of institutes for exchange managers in various parts of the state during the year. This is a feature that has been considered for some time, but no action has been taken to put it into effect. Several of those present at the meeting declared themselves in favor of a uniform accounting system supervised by the state.

While no action was taken and all discussions were informal, it is expected that some action will be taken for a uniform accounting system at the next annual meeting of the North Dakota Independent Telephone Association. Other informal meetings like the one just recently held may also be called for various sections of the state during the year.

Michigan Company to Increase Stock and Rebuild Exchanges.

The Union Telephone Co., of Owosso, Mich., has decided to increase its capital stock from $1,000,000 to $1,500,000, and to rebuild its plants at Mt. Pleasant, Alma, Lakeview and Corunna.

Dispatching Tugs by Telephones

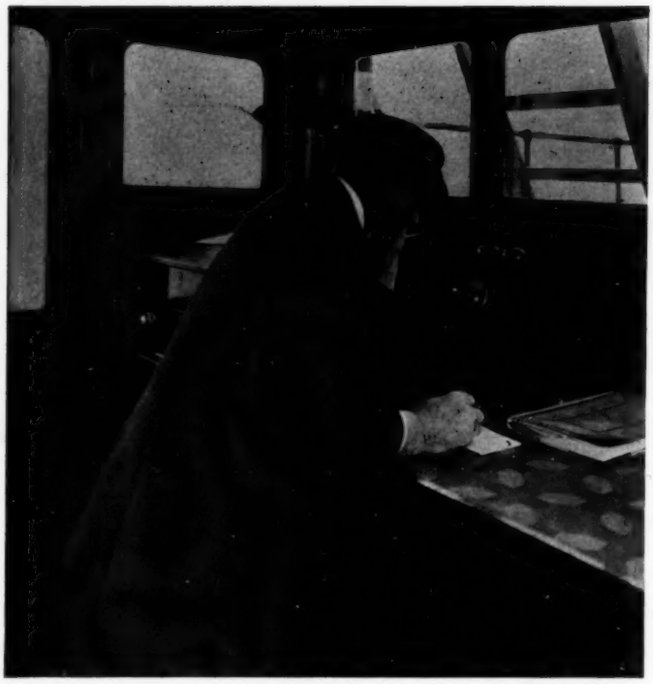
Causes Leading to Adoption of a Telephone Dispatching System for Tugs in New York Harbor by the Baltimore & Ohio Railroad Co.—Description of System in Use—Reproduced Through the Courtesy of The Telephone Review

By H. B. Fenn

In a large terminal port such as New York, a marine department which operates the tugs, lighters, car floats, barges, etc., of a railroad company terminal is a necessity in the handling of freight business.

Freight is brought into the port by rail from all parts of the country, and its various destinations require that it be transferred to different locations, such as outbound ocean steamers, terminal warehouses, freight stations, and numerous other delivery points. This distribution is mostly made by the marine department.

In some cases, the freight is unloaded from the cars onto barges or lighters and is towed to its destination or point of reshipping. In other cases, the cars are transferred to the terminal of another railroad company by means of car floats. In this event the cars themselves are run onto the floats, which are then towed to the proper railroad terminal where the cars are shifted to the tracks of the other railroad company.



Captain of "George M. Shriver" Using Telephone in Pilot House.

This is usually done where the point of destination is not reached by the lines of the railroad company first handling the cars. This distribution of freight in this manner is carried on both day and night, and in order to minimize delays, the telephone is used extensively.

The movement of the tugs handling the barges, car floats, etc., is controlled at a central point by a dispatcher, who instructs the captain by telephone where to call, and the point of delivery, thus saving considerable time.

In order that the captain may more readily communicate with the tug dispatcher, the New York Telephone Co. has recently installed for the Baltimore & Ohio Railroad Co. a complete telephone tug dispatching system whereby the captain of a tug, without leaving his boat, may communicate directly by telephone with the dispatcher, who is located at St. George, S. I., at any time of the day or night when the tug is at dock.

This installation was made by means of regular jack and plug steamer equipment. Common battery telephone sets of the hotel type were installed in the pilot house of each of the ten tugs of this terminal, and on two steam lighters.

The instruments are placed permanently and are wired to two permanent jacks on the exterior of the boat, one on the bow and one on the stern. Other jacks are located on the sea end of ten of the Baltimore and Ohio piers, at different points in Manhattan, Brooklyn, and St. George, S. I., the latter point being the New York freight terminal of this railroad company.

The jacks on the piers in New York and St. George are bridged to extension lines connected to the railroad's different private branch exchanges at each place, which boards are connected by tie lines, and the tug dispatcher is thus reached. In Brooklyn the jack at the end of the pier is bridged to an individual line. In this case the dispatcher is reached by means of our toll lines to the St. George switchboard.

Connections are established by means of a flexible deck cable with a plug on each end, which is carried on each boat. When a boat lands at the dock, a member of the crew plugs one end of the flexible cable into one of the jacks on the boat and then goes ashore and inserts the other end into the jack on the dock. The service is then ready for the captain to make a call from the pilot house, the same as from any other extension station.

Prior to this installation it was necessary when the boat landed at the pier, for the captain to send the mate or some other member of the crew to a telephone in the office, which is usually located at the land end of the pier—in most cases a distance of almost a quarter of a mile from the landing point. It frequently occurred that the members of the crew, who are mostly foreigners, were unable to understand the dispatcher's orders and would return to the boat and so advise the captain, who would then himself go to the telephone so as to make sure of the orders before proceeding. This resulted in a loss of valuable time and also necessi-

One of the B. & O.'s Fleet of Tugboats Which Operate in New York Harbor.

tated the captain leaving his boat, which is contrary to good practice.

E. A. English, marine supervisor of the Baltimore & Ohio Railroad Co., estimates the cost of operating the company's tugs at approximately $10 per hour each, so it will readily be seen how quickly the loss of a few minutes in this way runs into money.

The captains are all human and in going up the pier it is not unlikely that they will meet some one of their friends and stop for a few minutes chat, thereby losing further time.

Making Connection Between Tug and Shore—Close-up View of Jack.

As previously stated, these boats are operated both day and night, and frequently after the offices on the piers were closed, it was necessary for the captain to go ashore and search for a public telephone in order to get in touch with his dispatcher. This quite often resulted in an extended search, as along the water front practically the only telephones available at night are in cafes. It is, of course, undesirable for the captains to frequent such places, as a great deal is dependent upon the responsibility of this officer in the operation of the boats. All of this is now eliminated by the telephone dispatching installation.

Train dispatching by telephone is now quite generally in use by the different railroad companies throughout the country, but as far as we know, the Baltimore & Ohio Railroad Co. is the pioneer in the adoption of a special telephone system for tug dispatching.

The tugs are very powerful, some of them being 850 to 1,200 horsepower. Can you imagine leaving a thousand horses hitched to the end of a pier while their keeper searched for a place to feed them? This is practically what resulted under the old system.

The accompanying illustrations show the different equipment in use.

Since the installation for the Baltimore & Ohio has been completed, an order has been received to equip the tugs and piers of the Lehigh Valley Railroad Co. with similar equipment, and I am of the opinion that it will shortly be adopted by all of the railroad companies operating floating equipment in New York harbor. When this is done, there will probably be a working agreement between the different railroad companies which will permit of an interchange of these telephone facilities so that it will be impossible for a tug to go more than 10 or 15 piers without being able to get in touch with the dispatcher. This will make an ideal arrangement and will prove a good investment for the railroad companies. Meanwhile, the present facilities are giving the greatest satisfaction.

Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision Over Telephone Companies—Decisions of Courts in Matters of Interest to Public Utilities and Actions of City Councils Relative to Franchises, Rates and Service

Free Service to Nebraska Legislators Forbidden by Law.

The Nebraska legislature has passed, with but slight opposition, a law making it unlawful for any telephone company or the owner of lessee of any system, or the agent, officer or employe of any company or owner or lessee to directly or indirectly furnish to any state, officer, state appointee or employe or any member of the legislature or to any county officer a telephone or telephone service free or at a price less than is charged other customers for similar service.

The penalty for any company, owner or lessee is a fine not less than $100 nor more than $1,000, while the luckless agent, officer or employe who shall violate or assist in the violation of the act shall be imprisoned in the county jail not less than 30 days nor more than six months.

A second provision in the law makes it unlawful for any of the public officers described to directly or indirectly receive any free service or service at a reduced price. Their punishment is a fine of from $100 to $500 or from 30 days to six months in the county jail.

Senator Robertson jocosely remarked, when the bill passed the upper house, that inasmuch as members of the legislature are exempt from arrest while in attendance upon the sessions and that that is about the only time they would have an opportunity to secure free service, the bill will not affect the lawmakers.

The bill was introduced by Governor Neville at the request of the senate committee that investigated charges that the Bell was furnishing free service to legislators. The committee was unable to substantiate the charge, but saved its face by evolving this measure. It was introduced in the senate March 28, and passed the house on April 6, a record run, being sent to third reading in each house direct from the standing committees.

This is the only bill immediately affecting the telephone companies of the state that ran the legislative gauntlet. The one senate bill that reached the house was killed in the standing committee of that body. It was by Senator Adams and included telephone companies in the list

of public utilities that councils of cities of the second class—less than 5,000—might regulate rates and service. The house committee adhered to its previous ruling that the state having adopted the policy of regulation by a state commission, the authority should not be divided, especially with reference to telephone companies whose exchange service is not co-extensive with municipal limits.

Abuses in the Operation of Mutual Lines in Nebraska.

The Nebraska State Railway Commission is seeking—so far vainly—for a method of correcting abuses that have become numerous in the operation of farm mutuals in that state. Under the Nebraska law the commission has jurisdiction of rates and service only of these companies that do a general telephone business; that is, sell service to whoever will contract therefor. This exempts farm mutuals.

A number of instances have been brought to the attention of the commission where these farm mutuals, that have pre-empted territory, refuse to furnish service to applicants. Sometimes this means an extension of their lines, but oftenest the application comes from persons located along or adjacent to existing lines and between members of the mutual company receiving service. Many of the mutuals have a rule that not to exceed 15 subscribers to a line will be permitted, and with their lines full they refuse to attach any more. In other cases the action is purely arbitrary. The result is to deprive the applicant of service since no private company can operate in competition with the mutual.

Attorney General Reed has furnished the commission with a legal opinion that he can find no law or rule that gives the commission the right to interfere, although the effect is a discrimination that the policy of the law frowns upon.

Nebraska Bell Seeks to Issue $2,000,000 Worth of Stock.

The Nebraska (Bell) Telephone Co. has asked permission of the state railway commission to issue and sell $2,000,000 worth of stock at par. Of this sum $1,100,000 is to take up floating indebtedness in the shape of notes, and the remainder, $900,000, is to be used for extensions and betterments.

In its application the company sets up that it has a market for all of the stock at par it asks authority to issue. Because of the inability to float stock at par during the past few years, the company has preferred to borrow money upon the open market. The company's average dividend for 20 years has been 6 per cent.

The state commission has sent one of its telephone experts to Omaha to go over the books and records of the company to check up items of indebtedness and to examine into proposed construction.

Maryland Court as Liability for Cutting Trees.

Where telegraph linemen in caring for the line went upon plaintiff's property and cut trees therefrom, their acts, though wrongful or negligent, are to be treated as the act of the defendant company, being in furtherance of its business, since it is only when the servant abandons his duty and willfully becomes a wrongdoer that the master is exempt from all responsibility for the wrongful act. In action for injuries to realty by cutting trees therefrom in construction of telegraph line, the owner was entitled to show depreciation of the value of the property resulting from the trespass by showing its value before the trespass and its value thereafter.—Western Union Telegraph Co vs. Rasche; Court of Appeals of Maryland; 99 Atlantic, 991.

Removal of Poles Obstructing Public Road.

Telephone poles standing on the right of way in such proximity to the traveled road as to materially interfere with the work of permanently improving it, constitute an obstruction to the use of the public road by the traveling public, within the meaning of section 56a (77), c. 45, Barnes' code (code of West Virginia of 1913, paragraph 1844).

The pendency of a suit brought by such telephone company simply to enjoin the county court and its contractors, engaged in making permanent highway improvement, from willfully and wantonly destroying its poles and wires, and the granting of a temporary injunction order restraining such willful trespass, is no impediment to the right of the county court to apply for a writ of mandamus to compel such telephone company to remove its poles and lines.—County Court of Wyoming County vs. White; Supreme Court of Appeals of West Virginia; 91 Southeastern, 350.

Protective Company Not Entitled to Use of City Streets.

The New York laws of 1848, chapter 265, entitled "An act to provide for the incorporation and regulation of telegraph companies," etc., declares in section 1 that any number of persons may associate to construct a telegraph line. Plaintiff company was incorporated under a certificate, reciting that the incorporators associated themselves together for the purpose of doing a general telegraph electric protection business, and for the purpose of owning, constructing, and maintaining an electric telegraph to protect buildings and their contents against burglary and fire, and for doing a general telegraph business. Plaintiff did not engage in a general telegraph business, its business consisting in maintaining protection alarms operated by electricity.

The court held, that as the provision relating to general telegraph business might be regarded as surplusage, plaintiff was not, under the act or its amendments, entitled to use the streets as a telegraph company.—Holmes Electric Protective Co. vs. Armstrong; Supreme Court of New York; 162 New York Supplement, 770.

Alabama Ruling on Sale of Telephone System.

Where there was no ambiguity on the face of a conveyance of the grantor's "entire telephone plant and system" in describing property conveyed and warranted to be the property of the grantor, but it was developed by parol testimony that a third party owned a part of the property described, parol evidence was admissible to show that it was not within the contemplation of the parties that the conveyance should carry the title to the property thus owned. The measure of damages for a breach of warranty in a conveyance of a telephone plant and system was the value of that which was lost at the time of its loss, and, if the warranty was breached in the making, the value at that time.—Wilder vs. Tatum; Court of Appeals of Alabama; 73 Southern, 833.

Dividends Paid but No Fund Set Aside for Depreciation.

The Linwood (Neb.) Telephone Co., a small Independent company located in Butler county, ran against the old didn't-care-for-depreciation snag when its officers appeared before the state commission recently with an application for increasing residence rates from $1.25 to $1.50 per month and business from $1.75 to $2.

The usual notices to municipal officers and others interested were mailed by the commission, but when the matter came on for a hearing April 4 no objections were filed. The hearing developed that the necessity for increased revenue arose from the fact that the company had been too intent upon paying satisfactory dividends and had not set aside a sufficient depreciation fund.

The treasurer accepted the suggestion of the commission that he withdraw the application, keep the old rates in force, pass up a dividend and come back after a year's trial if he deemed it necessary.

Michigan Supreme Court Upholds Physical Connection.

The Michigan acts of public 1913, No. 206, authorizing the railroad commission to order a physical connection of the lines of telephone companies "whose lines by such connection can be made to form a continuous line of communication."

gives the commission power to order physical connection of telephone lines, whenever and wherever those lines by such connection can be made to form a continuous line of communication, whether the communication is between different towns or between subscribers to different telephones in the same town.—Michigan State Telephone Co. vs. Michigan Railroad Commission; Supreme Court of Michigan; 161 Northwestern, 240.

Seeks to Enjoin Company from Collecting in Advance.

D. A. Skeen, an attorney of Salt Lake City, Utah, has filed suit in the civil division of the city court to enjoin the Mountain States Telephone & Telegraph Co. from collecting the charge for service of his residence telephone in advance. A temporary restraining order was issued by the court and served on officials of the telephone company.

Appearing as plaintiff and counsel, Mr. Skeen charges that the company has frequently endeavored to enforce a rule requiring that payment for telephone service be in advance, in making collections of the charge against him for a telephone at his residence. The rule is referred to in the complaint as "arbitrary. unjust and unreasonable."

The plaintiff asks that the temporary restraining order issued by Judge Wilkins be made permanent and that the company be enjoined permanently from removing the telephone from his residence or denying him service upon his refusal to make payment in advance.

Bill to Permit Pennsylvania Companies to Consolidate.

A bill has been introduced in the senate of the Pensylvania legislature by Senator McConnel, of Northumberland, giving telephone companies the right of eminent domain over private and public property, and competing telephone companies the right to consolidate.

Minimum Wage for Women Upheld by U. S. Supreme Court.

The Oregon law fixing minimum wages for women, the first compulsory minimum wage statute ever before the United States Supreme Court, was upheld as constitutional by that body by an equally divided court. Similar compulsory laws of Washington, Colorado, Wisconsin, California, Utah, Minnesota and Ohio were sustained.

New Jersey Stock and Bond Bill Disapproved.

Senate bill No. 170, introduced in the New Jersey legislature by Senator McCran, by request, exempting public utility corporations doing business in other states from obtaining permission to issue stocks and bonds, in certain cases, was disapproved by Governor Edge March 29. In doing so the governor expressed himself in sympathy with the apparent purpose of the bill, but doubted whether decisions of courts justified the assumption as to its practical effect.

Excessive Damages for Injury to Lineman.

The plaintiff, a young man of 23, earning $2.80 per day as a lineman, had as a result of the injury lost a portion of one hand and one rib, and the end of the severed rib interfered with the stomach, rendering his movements painful and difficult, and skin had to be grafted in many places. The court held a verdict of $16,000 was not so excessive as to indicate passion or prejudice in the minds of the jury.—Myers vs. City of Independence; Supreme Court of Missouri; 189 Southwestern, 817.

Summary of State Commission Hearings and Rulings.

ALABAMA.

April 11: Hearing at Montgomery in the case of City of Birmingham vs. Southern Bell Telephone & Telegraph Co., in which the city is asking for a reduction from the present rate of $3 for residence telephones and $6 for business telephones. The rates are alleged to be out of proportion to the capital invested and a reduction is demanded.

CALIFORNIA.

March 27: Complaint filed by Mrs. Mason Wilson, of San Francisco, against the Pacific Telephone & Telegraph Co. asking that the company's present stand with respect to a telephone bill alleged to be erroneous be condemned; also that the company make no discrimination with respect to its rules for bill payments.

Mrs. Wilson alleges that the company last November rendered her an incorrect bill for service on her telephone. She asked for a corrected statement, but the company, she says, refused to send the statement and arbitrarily took out her telephone because she refused to pay the bill until the corrected statement was rendered. She says that she was deprived of a telephone by the company for a period of two months, and she finally made informal complaint to the railroad commission, with the result that the company was ordered to reinstall her telephone. This order was made last month. Now, Mrs. Wilson alleges, the telephone company is trying to compel her to pay for the telephone during the two months' period that she was without it, and also to make her pay $1 for re-connection.

CANADA.

March: The commission granted the application of the Welland County Telephone Co., of Bridgeburg, Ontario, for permission to increase its local rates, but denied permission to charge for calls between Bridgeburg and Ridgeway, Stevensville and other nearby points.

ILLINOIS.

March 15: The commission authorizes the Farmers Mutual Telephone Co. to sell, and the Altona Farmers Telephone Co. to purchase the entire plant and system of the former at Altona, Knox county, and immediate vicinity for $2,175 cash or capital stock taken at par, together with an indebtedness of $900 to be assumed by the purchaser.

The Altona Farmers Telephone Co. is granted a certificate of convenience and necessity to operate in the village of Altona and is authorized to issue its common capital stock to the amount of $2,175. To take care of the remainder of the assumed indebtedness, after making cash payment thereon of $400, the Altona company is authorized to issue its promissory note for $500 at 6 per cent. interest.

March 19: The commission authorized the Adair (Ill.) Telephone Co. to issue its promissory notes in the aggregate amount of $1,500, the proceeds to be applied to the purchase of certain property in the village of Adair. Case 6454.

March 22: Agreement between the Lake Erie & Western Railroad Co. and the Coon Brothers Telephone Co. by which the telephone company is given permission to place one line of iron pipe conduit for telephone wire across the right of way of the railroad company one-half a mile east of Saybrook, approved. Case E-685.

March 22: The commission suspended the proposed advanced rates for telephone service in London Mills by the Abingdon Home Telephone Co. until July 29, 1917, pending a hearing concerning the propriety of the proposed advance in rates. Case 6423.

March 22: The commission authorized the reorganization committee of the Western Illinois Telephone Co., of Macomb, to sell, and the Golden (Ill.) Farmers Telephone Co. to purchase, for the sum of $785, all of the property of the former within the corporate limits of the village of Golden and Clayton township. Case 6303.

March 22: The commission approved the construction of a 17,500-volt transmission line over the lines of the Kinloch Telephone Co. at the foot of Plum street, Alton. Case 6312.

March 22: The commission approved the construction of a 17,500-volt transmission line over the lines of the Kinloch Telephone Co. at a point in the yards of the Illinois Glass Co. 100 ft. west of its power substation. Case 6313.

March 22: Agreement for joint use of a certain pole line in Hancock county by the Western Union Telegraph Co. and the receivers of the Central Union Telephone Co. Case 6473.

March 22: Agreement for joint use of a certain pole line in East Peoria by the Citizens Telephone Co., of Pekin, and the receivers of the Central Union Telephone Co. Case 6464.

March 22: The commission approved a contract between J. W. H. Smith, doing business as the Metropolis Telephone Co., at Metropolis, and the Cumberland Telephone & Telegraph Co., of Mt. Carmel, for the joint use of certain facilities. Case 6358.

March 22: The commission approved a joint pole agreement entered into by the Central Illinois Public Service Co. and the receivers of the Central Union Telephone Co. providing for the joint occupancy of a certain line of poles in the village of Windsor. Case 6334.

March 26: The commission approved the sale of certain real estate, located in the city of Chicago, to Charles B. Cave, for the sum of $4,800. Case 6425.

April 10: Hearing at Chicago in the case of the City of Peoria vs. the receivers of the Central Union Telephone Co., on the petition to compel the Central Union company to reduce its telephone rates to subscribers in the city of

Peoria. Cross petition filed by receivers of the Central Union company. Case 3043.

MAINE.

March 28: Complaint filed by Dr. Ralph A. Parker. of Green, and seven others, against the Lewiston, Greene & Monmouth Telephone Co., and the New England Telephone & Telegraph Co., alleging that the service from the Monmouth exchange is inadequate and insufficient, and that the New England company has failed to, after due request from certain of the petitioners, avail themselves of such means as is possible to supply telephone service to the petitioners in the town of Greene, Androscoggin county.

NEBRASKA.

April 2: Application of Nebraska Telephone Co. to increase two-party line rate at Howells from $12 to $15 per year, approved. Application for readjustment of rates at Wakefield exchange; matter continued until June 11 or at some later date at the convenience of the commission.

April 4: Hearing held on application of Linwood (Neb.) Telephone Co. to increase residence rates from $1.25 to $1.50 per month and business rates from $1.75 to $2. No respondents appeared. Applicant withdrew request for increase and agreed to keep present rates in force for one year.

April 4: Application of Nebraska Telephone Co. to place new schedule of rates, pending since December 12, in force at Millard exchange approved, and new rates ordered to be collected from April 1.

April 4: Gilead (Neb.) Telephone Co. authorized to publish rate of one-half of regular tariff for any particular class of service for extension sets, rates now in force being $1.25 for business and farm lines and $1 for residence.

April 4: Nebraska Telephone Co. requested permission to destroy records. An examination thereof by a representative of the commission having satisfied that body that these records have lost their usefulness or been made a part of the company's permanent record, the authority was granted.

April 4: Complaint filed by R. M. Anderson that the Auburn (Neb.) Telephone Co. took out line when he had objected to character of service given. Company notified to make explanation.

April 5: Davenport & Kiowa Telephone Co., of Davenport, granted authority to publish rate of $1 a year for extension bells and extension sets, the cost of same and of installation to be borne by subscribers.

April 5: Nebraska Telephone Co. authorized to cancel grounded rates at Spalding exchange, of $24 for individual business and $12 individual residence, it appearing to the commission that there are no subscribers now taking such service and that the company does not desire to offer it for the future.

April 5: Complaint filed by the Blair (Neb.) Telephone Co. that the Nebraska Telephone Co., in spite of existing law requiring the payment of commissions on "in" toll calls, insists upon compliance with an old contract whereby none is paid. Bell company has exchange in Blair also. Commission asks explanation.

April 5: Nebraska Telephone Co. asked permission to issue and sell $2,000,000 worth of stock at par. Examination of books ordered.

April 7: Hearing on application of Cuming County Independent Telephone Co. for permission to issue $16,500 stock to build new exchange building at Wisner and for construction work. Hearing continued to April 13.

April 7: Application filed by group of farmers in and around Odell for leave to sell $25,000 worth of stock to build competing exchange. Showing of necessity ordered.

April 7: Wyoming & Nebraska Telephone Co. granted authority to make $2 charge where instrument has been removed and then reinstalled and 50 cents for removal from one place to another in same building.

April 7: The commission ordered that unless stock is given in exchange, the Antelope Mutual Telephone Co. cannot require new subscribers to build lines and then donate them to the company while also being charged schedule rate for service.

April 7: North Platte Farmers Independent Telephone Co. ordered to show cause why, without securing consent of the commission, two farm lines were separated and each placed under different company ownership.

April 7: Complaint against the Edison (Neb.) Telephone Co. as to unjust charge for use by non-subscribers. The Edison company had a rule that such use shall be compensated by a 10-cent charge. A connecting farm line company charged nothing. The commission holds that the rules of the exchange and not the rule of the line for whom the exchange switches must govern.

April 26: Hearing on complaint of W. C. Bender and others against the Lincoln Telephone & Telegraph Co. Misrepresentations of agents of the company are alleged. Parties on rural lines out of Yuban exchange were formerly given grounded line 20-party service. In soliciting for change to metallic circuit 10-line maximum party service, agents of the company are alleged to have stated that legislative committee of farmers' union approved rates fixed in commission order regulating such service.

NEW YORK.

March 30: Hearing on proposed increase in rates by the New York Telephone Co. in the village of Clinton, which was to have been held on this date, has been indefinitely postponed.

April 13: Continued hearing at Albany in the case of the residents of the town of Argyle and vicinity vs. the New York Telephone Co. The complainants ask that the commission grant an order directing the telephone company to restore the zone or territory service between the towns of Argyle, Kingsbury, Queensbury and elsewhere, as it was previous to November, 1916, free from toll charges and granting other relief as might be just and proper.

OHIO.

March 31: New rate schedule filed by the Ohio State Telephone Co. for Alliance, which provides for increases in the rates for business service and individual line residence service. Following is a comparison of the new rates filed, both gross and net, with the present rates:

Individual line, business, gross $3.25, net $3.00, present $2.50.

Two-party line business, gross $2.75, net $2.50, present $2.00.

Individual line, residence, gross $2.25, net $2.00, present $1.75.

Two-party line, residence, gross $1.75, net $1.50, present $1.50.

Four-party line, residence, gross $1.50, net $1.25, present $1.25.

The gross rates are subject to a discount of 25 cents if paid on or before the 15th of the month.

April 7: Entry making final the tentative valuation placed upon the property of the Star Telephone Co., of Ashland, as summarized in the order entered February 14.

OREGON.

March: Application filed by the Canby Co-Operative Telephone Association for authority to increase certain rates.

PENNSYLVANIA.

March 30: The commission approved the additional franchise contract between the Central District Telephone Co. and McDonald borough.

March 30: Sale by the American Telephone & Telegraph Co. to the Central District Telephone Co. of its plant and equipment in New Castle, approved.

WISCONSIN.

March 28: Testimony taken at Green Bay by Examiner R. W. Clarke, of the state railroad commission, on applications of the Casco Telephone Co. and the Luxemburg Telephone Co. for permission to extend lines into the same territory between Casco and Luxemburg, in Kewaunee county.

April 4: Hearing on the application of the Oconto (Wis.) Rural Telephone Co. for permission to increase rates. U-1054.

April 5: Hearing on the application of the Amherst (Wis.) Telephone Co. for authority to adjust rates. U-1061.

April 6: Hearing on the application of the Tamarack Telephone Co. for authority to increase rates. U-1062.

April 11: Hearing on the application of the Benton (Wis.) Telephone Co. for authority to increase rates. U-1007.

April 12: Hearing in the case of Swen Anderson et al. vs. the Prairie Farm Ridgeland & Dallas Co-Operative Telephone Co. U-1065.

April 13: Hearing on the application of the Spooner Telephone Co. for an order fixing a rate for switching the lines of the Evergreen Telephone Co. U-1063.

April 13: Hearing at Milwaukee in the case of I. W. Moyle et al. vs. the Big Bend, Prospect & Guthrie Telephone Co. and the Wisconsin Telephone Co., relative to physical connection. U-1057.

April 16: Hearing at Wonewoc in the case of Wencle Jansky vs. the Badger Telephone Co. and the Pine River Telephone Co., relative to physical connection. U-1059.

April 16: Hearing at Wonewoc in the case of Joseph Haugh et al. vs. the Badger Telephone Co. and the Champion Valley Telephone Co., as to physical connection. U-1060.

April 17: Hearing on the application of the Briggsville & Big Spring Telephone Co., of Briggsville, for authority to increase rates. U-1053.

April 24: Hearing at Hammond in the case of the Hammond Telephone Co. vs. the Wisconsin-Minnesota Light & Power Co., relative to inductive interference. U-1056.

April 25: Hearing on the application of the Cadott (Wis.) Telephone Co. for authority to increase rates. U-1068.

April 26: Hearing on the application of the Reedsburg (Wis.) Telephone Co. for authority to increase rates. U-1069.

April 27: Hearing at Ashland in the case of the Commercial Club of Ashland vs. the Ashland Home Telephone Co. and the Wisconsin Telephone Co., as to connection and rates. U-1066.

May 1: Hearing on the application of the Rusk County Rural Telephone Co. for authority to increase rates. U-1070.

Report of Australian Telephones

Postmaster General's Department Issues Financial Report for Operation of Government Telephone System for Year Ended June 30, 1916—Development Still Arrested Owing to War—Increase in Earnings and Stations Installed

The sixth annual report of the postmaster general's department of the commonwealth of Australia, prepared by Chief Accountant G. G. Haldane, was recently made public. The report shows that on June 30, 1916, there were in operation in Australia a total of 168,416 telephones, an increase of 11,099 over the preceding year.

With an estimated population of 4,902,939 in the commonwealth of Australia, this averages one telephone to every 35 persons. The number of exchanges in operation increased in the same period from 1,673 to 1,882.

The earnings for the year ended June 30, 1916, were £1,273,487, an increase of £163,595 over the preceding year. An increase was also shown in the trunk line (long distance) revenues, the total revenues being £244,385, an increase of £39,599.

Owing to the necessity of reducing capital expenditures as much as possible during the continuation of the war, the construction program was largely curtailed. The building of several long distance trunk lines and the extension of the automatic telephone systems was postponed for this reason.

A reduction was made in the number of main telephone directories issued from three to two per year, owing to the scarcity of paper and the number of supplementary lists increased from three to four per annum.

During 1915 an organization committee inquired into arrangements at telephone exchanges in the Melbourne metropolitan area. As a result the staff has been reorganized and the Willis street exchange closed, effecting a saving at the rate of £11,456 per annum.

Automatic recording registers have been made available to subscribers to certain telephone exchanges in New South Wales and Victoria at 10 s. per annum. The question of the extension of their use is awaiting the result of the trial in the states mentioned.

Formerly in cases where the revenue to be derived from a desired telephone line was estimated not to equal the required revenue therefrom within the regulation period of eight years, the department would not undertake erection of the line.

It has now been decided, however, that the Department may, in certain cases, undertake the erection of such lines, but only where the estimated deficiency does not exceed a total of £10 (half of which would be borne by the department).

Subscribers to telephone exchanges entitled by the revenue to a continuous service on Sundays have been invited to accept a limited service on that day. Subscribers who voluntarily agree to such curtailment are not charged the usual opening fee for the transaction of urgent business during the period the exchange is closed.

By the adoption of a method of lengthening 19-ft. iron poles to 24 ft., at a cost of about 3s. 10d. per pole, it has been possible to convert a number of excess 19-ft. poles into 24-ft. poles, of which latter there was a shortage.

During the year further exchanges in the Sydney metropolitan network were converted to automatic operation, viz., Ashfield, Burwood, Homebush, Mosman, Parramatta, Lidcombe and Vaucluse. Chatswood, in the Sydney network, and Port Adelaide, in the Adelaide network, have since been opened, while work is in progress on two other semi-automatic exchanges in Adelaide, Unley, and Norwood.

Approval is being sought to equip four of the Melbourne metropolitan exchanges with automatic apparatus, viz., Malvern, Ascot, Canterbury, and Collingwood.

The department's records so far kept have established the fact that the automatic equipment not only provides a thoroughly satisfactory service, but is rather less costly to maintain and operate than the manual common battery and magneto systems.

The arrested development of the telephone service brought about in 1914 by the war continued in 1915 and 1916, though there are signs of a recovery in some districts. The shortage of staff, due to the number of enlistments, has in some places caused a little difficulty, though every possible effort has been and will be made to release every man who desires to enlist, and in very few cases has it been found impossible to provide a substitute.

State.	1915-16. Loss.	1915-16. Profit.	1914-15. Loss.
New South Wales	£142,282	.....	£179,503
Victoria	60,634	.....	95,099
Queensland	8,147	.....	7,796
South Australia (including Northern territory)	.....	£4,194	7,399
Western Australia	55,038	.....	87,925
Tasmania	9,786	.....	12,979
Totals	£275,889	£4,194	£390,703
Total net loss, 1915-16	£271,695		
Total net loss, 1914-15	390,703		

Results of Operation of Australian Telephone System.

	New South Wales.	Victoria.	Queensland.	South Australia (incl. Nor. Ter.)	Western Australia.	Tasmania.	Total Commonwealth, 1915-16.	Total Commonwealth, 1914-15.	Total Commonwealth, 1913-14.	Total Commonwealth, 1912-13.
Earnings	£508,594	£355,484	£180,577	£112,103	£ 79,117	£ 37,612	£1,273,487	£1,109,892	£ 994,888	£862,572
Working expenses (inclusive of pensions, etc.*	533,411	319,575	150,379	84,173	110,721	39,028	1,237,287	1,223,900*	1,079,461*	929,912*
Interest on capital†	117,465	96,544	38,345	23,736	23,435	8,370	307,895	250,101†	211,851†	154,417†
Earnings compared with working expenses — Surplus	.....	35,909	30,198	27,930	.....	.....	36,200	.....	.....	.....
Earnings compared with working expenses — Deficit	24,817	.....	.....	.....	31,604	1,416	.....	114,008	84,573	67,340
Result after providing for working expenses and int. — Profit	.....	.....	.....	4,194	.....	.....	.....	.....	.....	.....
Result after providing for working expenses and int. — Loss	142,282	60,635	8,147	.....	55,039	9,786	271,695	364,109	296,424	221,757
Percentage of working expenses to earnings	104.879	89.898	83.277	75.085	139.946	103.765	97.157	110.272	108.501	107.807

*The working expenses for the year 1915-16 include a proportion of pension and retiring allowances, viz., telephone, £2,817. The corresponding figures for the year 1912-13 to 1914-15 inclusive do not include any proportion of pensions and retiring allowances.

†The interest on capital for the respective branches for the years 1912-13 to 1914-15 inclusive does not include any proportion of interest on general assets.

Summary of Results of Operation of Australian Telephone System for the Year 1915-1916, Compared with Preceding Year.

WHEN YOU BUY

OUR share in this partnership is carried out by our Operating Department, a group of highly trained men whose constant effort and accomplishment is to make it easier and cheaper to render 100% telephone service.

Constantly visiting many different Automatic Exchanges, ranging in size from 100 to 50,000 lines, these men observe conditions, compare methods, discover new and better ways of obtaining results. And the information they thus gather, the experience they gain, is always at your disposal.

Our interest in your Automatic exchange never ceases, our pride in the service it gives your subscribers is constant, our efforts to help you give even better service at even lower cost, are continuous.

Your share in this partnership is to install the Automatic system.

Your Company and your employes both benefit by this partnership with us, for to the Company it means real dollars and cents economy and to the men it means better maintenance with less work.

Why does it mean economy? Because every Automatic Exchange has always within reach the most efficient and scientific methods of keeping its equipment constantly at the highest pitch of excellence, thus reducing depreciation and repair charges to a minimum.

And why better and easier maintenance? Because the men in charge of the equipment are kept informed of the simplest and most direct way of doing their work.

This means satisfaction to your patrons, better work with less effort to your employes, more profit to your stockholders.

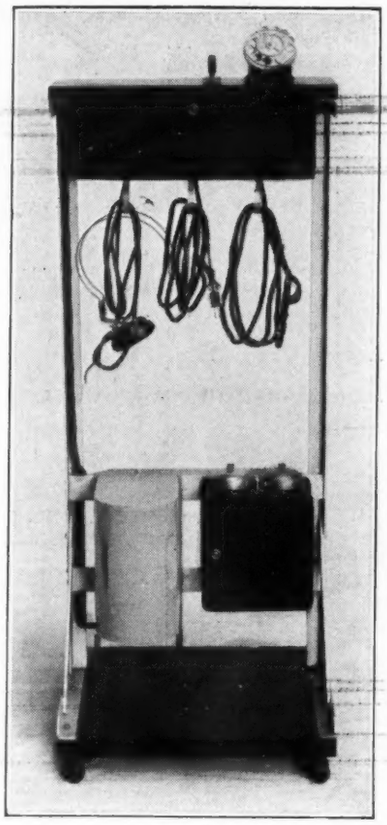
Details as to what we have been able to do for other companies will be furnished upon request.

AUTOMATIC ELECT

Makers of over 1,000,000 Autom

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

UTOMATIC YOU BUY INTO A PARTNERSHIP



The connector test box illustrated here is one of the many devices and methods developed by our Operating Department and placed at the disposal of the Companies that install Automatic.

With this test box it is possible easily and quickly to put a connector switch — which corresponds to the operator's cord circuit—through its paces, discover whether it is in perfect condition, reveal any minor faults, and correct them **before trouble develops.**

It enables Automatic Exchanges to forestall subscribers' complaints, and saves the switchmen the tedious task of finding trouble after it is reported.

And after adjustments are made, the test box gives the maintenance man a true gauge of the result of his work. It puts an end to "guess" methods and makes correct adjustments a matter of certainty.

Let us tell you what Automatic Equipment can do for the maintenance men in your exchange.

C COMPANY, Chicago

Telephones, in use the World over

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

The increase in fees from a halfpenny to one penny per call from subscribers' lines took effect as from September 15, 1915, for new lines, and from December 10, 1915, for lines already in existence at the former date. The increase from one penny to twopence per call from public telephones was made effective from December 10, 1915. On the same dates the scale of subscribers' telephone rentals was altered from one which varied with the population of a telephone network to one which varies with the size of the exchange. The increased rates had the immediate effect of reducing the number of calls made, and this decrease was noticeable for several months; but the rate of calling has now practically returned to its former level. The number of public telephone calls is still considerably below its former level, however.

During the past year the department has manufactured in its workshops a large percentage of the total requirements of private branch exchange switchboards. Many of the parts used in the assembling of these switchboards have been made from raw materials, and others have been adapted from scrap or out-of-date recovered material. In a number of cases where it has been necessary to extend or rearrange the equipment at magneto exchanges the switchboards have been made or assembled in the department's workshops from recovered and adapted material.

Metropolitan network.	Number of subscribers on June 30, 1916.	Value of plant and equipment on June 30, 1916.	Direct working expenses. Operating, etc.	Repairs and renewals.	Total.	Revenue.	Excess.	Deficiency.
Sydney	32,438	£1,781,970	£90,872	£140,361	£231,233	£306,508	£75,275	£..
Melbourne.	24,623	1,591,710	60,825	76,958	137,783	229,407	91,624	..
Brisbane	6,814	355,801	15,632	19,266	34,898	68,190	33,292	..
Adelaide	7,538	373,146	15,715	22,459	38,174	76,258	38,084	..
Perth	4,985	384,332	9,353	34,080	43,433	48,969	5,536	..
Hobart	1,880	66,366	2,733	5,648	8,381	14,456	6,075	..

Comparison of Metropolitan Exchange Operations in the Various States.

Banquet and Stockholders' Meeting of Mankato Company.

The Mankato Citizens Telephone Co. recently held its annual banquet and stockholders' meeting, in the Masonic Temple, at Mankato, Minn. There were 174 stockholders present, including 58 women. A tasty and attractive menu was served, including mashed potatoes — conclusive evidence that the company is in a prosperous condition. Entertainment was provided by Miss Florence McGuiggan, of Mapleton, who sang several selections. Miss Clotilde Schroeder accompanied her at the piano.

The Mankato company is a citizens' company in all that its name applies. There are 405 stockholders, 95 per cent. of whom live in Mankato and are subscribers to the company's service. As stated in the article, the "Rise of a Minnesota Independent Telephone Company," by F. M. Ferguson, which appeared in TELEPHONY of November 4, 1916, it has been the practice of the company at the annual stockholders' meeting to give a banquet at the expense of the company. These gatherings have done much in cementing the relations of the stockholders and officers, and have played an important part in the success of the company.

Manager P. M. Ferguson, in his annual report for the year 1916, stated that the year just closed, under prevailing circumstances, has been a very successful one for the company. The company's indebtedness has been completely liquidated and the company does not now owe a dollar outside of its stock liability.

The year was closed with a net gain of 354 telephones, the largest in any year since Mr. Ferguson's affiliation with the company. The company now has in operation 3,950 telephones.

Attention was called to the fact that the estimated value of the plant had increased $12,000 since a year ago; the depreciation reserve had increased $8,000; the profit and loss account had increased $14,000; the operating income was $6,000 greater than shown by the report a year ago; the net income was shown to be $4,000 greater than that of a year ago; and the bills payable which a year ago amounted to $6,100, had been completely wiped out.

The balance sheet and income statement follows:

ASSETS.

Plant	$237,050
Accounts receivable	4,589
Stores account	6,184
Collector's fund	45
Toll accrued	185
Cash in banks	2,580
Petty cash account	100
Advance expense account	20
	$250,753

LIABILITIES.

Capital stock	$144,650
Depreciation reserve	53,665
Bills payable	
Taxes accrued	2,617
Salaries accrued	892
Profit and loss	48,858
Prepaid insurance	71
	$250,753

OPERATING INCOME.

Exchange rentals	$ 62,425
Toll system	2,656
Earnings from connecting lines	1,606
Commission from Tri-State company	2,376
Rents from pole and wire	236
Advertisements from directory	311
Total operating income	$ 69,610
Maintenance	$ 9,448
Expense—	
Traffic	9,462
Commercial	2,893
General	7,185
Reconstruction	3,115
Taxes	2,636
Rents paid	168
Total expense	$ 34,907
Net operating income	34,703
Deduct depreciation	8,885
	$ 25,818
Add rents from building	$ 118
Miscellaneous non-operating income	197
Purchase discounts	214
	$ 26,347
Deduct interest on bills payable	196
	$ 26,151
Deduct dividends paid	11,572
	$ 14,579
Deduct uncollectible	215
Surplus for year	$ 14,364

It was voted by the stockholders to increase the capital stock of the company from $150,000 to $250,000. Plans were discussed for installation of automatic equipment and the erection of a new building to house the new apparatus.

Charles E. Elmquist, member of the Minnesota Railroad & Warehouse Commission, who was present at the meeting, paid high compliment to the way in which the business of the company was managed. He said if every corporation were managed in the same able, honest and conscientious manner, with the same regard for the rights of the people, there would be less complaint against corporations in general.

A brief address was also made by F. D. Lindquist, secretary and treasurer of the Fulda (Minn.) Telephone Co., and also president of the Minnesota Independent Telephone Association.

The following directors, whose terms expired, were re-elected: Judge Lorin Gray, J. R. Brandrup, N. Peterson and Martin Walser. Robert A. Haedt was elected to the board of directors to succeed Martin Bowe.

The officers were all re-elected as follows: President, H. A. Patterson; vice-president, N. Peterson; secretary and treasurer, W. D. Willard; attorney, S. B. Wilson.

A semi-annual dividend of 4 per cent. was declared by the directors.

Queries on Theory and Practice

Switchboard Cable Color Code and Diaphragm Adjustment.

Will you please publish the color code for 50-pair switchboard cable? Should the diaphragm of the Dean transmitter rest on the carbon chamber? If not, how much space?

A typical color code used by a prominent manufacturer is as follows:

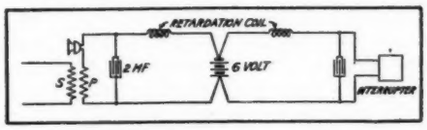
Pair No.	Code wire.	Mate.
0.	blue	
1.	orange	
2.	green	
3.	brown	
4.	slate	
5.	blue-white	
6.	blue-orange	
7.	blue-green	
8.	blue-brown	
9.	blue-slate	white
10.	orange-white	
11.	orange-green	
12.	orange-brown	
13.	orange-slate	
14.	green-white	
15.	green-brown	
16.	green-slate	
17.	brown-white	
18.	brown-slate	
19.	slate-white	
20.	blue	
21.	orange	
22.	green	
23.	brown	
24.	slate	
25.	blue-white	
26.	blue-orange	
27.	blue-green	
28.	blue-brown	
29.	blue-slate	
30.	orange-white	red-white
31.	orange-green	
32.	orange-brown	
33.	orange-slate	
34.	green-white	
35.	green-brown	
36.	green-slate	
37.	brown-white	
38.	brown-slate	
39.	slate-white	
40.	blue	
41.	orange	
42.	green	
43.	brown	
44.	slate	
45.	blue-white	red-blue
46.	blue-orange	
47.	blue-green	
48.	blue-brown	
49.	blue-slate	
50.	blue-orange-white	white

The diaphragm and the microphone cell must be in good mechanical contact. This is to allow the vibrations of the diaphragm to vibrate the front electrode and so cause variations in the resistance of the granular carbon.

Storage Battery and Its Connections for Various Purposes.

I have a starting battery (storage) 6-volts, capacity 7½ amperes for 13 hours. Can I use this battery to furnish current for one operator's transmitter, one telephone in a booth, the night alarm, and to run my interrupter? The interrupter is a Western Electric and I am using one-cell type R. R. Edison Leland battery to operate it. The switchboard is an express type sold by Julius Andrae & Sons Co.

If I can use this for purpose please tell me how to connect so that none of these



Battery Connections to Transmitter.

will interfere with the other. For instance, I was of the opinion that the current used to operate the interrupter would interfere with the transmission from the telephones, also there would be cross talk from the switchboard and the booth telephone.

How much current does the switchboard transmitter consume? This, of course, is in circuit all the time. How much current does an ordinary transmitter consume in 10 hours' continuous service?

Approximately how long can I use this battery before it would have to be charged? If this combination can be used, I will get an 8-volt 10-ampere dynamo and can run it with a 1/6 horsepower motor that I have and can charge the battery nights. Could I charge and use it at the same time—that is, will the charging current affect the transmitters?

Yes, the storage battery mentioned is ample for the service required. The operator's transmitter should be wired by a separate twisted pair clear to the battery treminal and not multipled onto anything else. This is to keep the interrupter noise from annoying the operator.

If the noise should bother, it can be eliminated by the use of a very low resistance, impedance coil and a condenser as indicated in the sketch. The night alarm will doubtless work without change.

The interrupter will need a retardation coil of sufficient resistance to keep the current down to a reasonable value and a condenser to absorb the spark. Both must be determined by trial.

The current consumption of a local battery transmitter depends upon the type of instrument and its condition. Perhaps from 0.1 to 0.2 ampere is as near the truth as we can get although we have seen transmitters which took 0.25 ampere. In ten hours this would represent from one to two ampere-hours or 2.5 ampere-hours for the highest.

We can not tell how long the battery will last between chargings, because we do not know the total current which all the apparatus will draw. We suggest that you try charging it twice a week and see how it keeps the battery up. Watch the voltage during charge and discharge, also the specific gravity of the electrolyte.

It is very likely that you can charge the battery at the same time as it is being used. There is a very cheap tube rectifier on the market which charges a battery with practically no noise. A description of this is soon to appear in TELEPHONY.

Case of Cross Talk in Cable Ground Return System.

We are operating ground return system and have recently installed a length of about 2,500 ft. of No. 22 gauge, double paper-wrapped, 0.12 m.f. capacity lead-covered cable. We find several subscribers complaining of cross talk, which is excessive on some wires. We use a pair as two-subscribers' lines and do not ground the mate of a pair. We have been and are now operating this way in other cables without any cross talk, comparatively speaking.

The pairs in question test positively clear of grounds or crosses with each other, using a 60-volt voltmeter for testing but they cross talk plainly. All the lines test normal, there being no excess resistance in line or return, and carbons are clean.

Is this a capacity trouble? It seems to me that if it is magnetic induction, I should have this trouble all through this cable. Please advise what, in your opinion, is causing this on only a few pairs.

The capacitance between wires in the cable is the cause of your cross talk. A half-mile of cable whose capacitance is 0.12 m.f. per mile has a capacitance of 0.06 m.f. Such a condenser will talk plainly.

The cross talk between the wires of a pair is worse than between wires which are farther apart. Only those wires which are adjacent will cross talk badly—the rest have not noticeable trouble because they are farther apart.

It is best to use only one wire of a cable pair for a telephone line and ground its mate at both ends of the cable.

Fabric Sleeves for Insulating Splices in Telephone Cables.

I am desirous of obtaining information in regard to the tubes used in insulating the splices in paper insulated telephone cables. These paper tubes, I believe, have been used exclusively for such work. I understand that fabric sleeving has been used for a similar purpose in telegraph cables. Can you tell me of any objection to using these fabric tubes in telephone cables?

If the fabric is free from chemicals, we see no objection to its use. What is needed is a material which, under the heat of boiling out with paraffine, and during a long period of time, will not corrode the copper wire. It is easy to obtain this condition.

High Tension Line and Parallel Grounded Circuits.

Will you please give us your opinion on the following situation: A high tension line using No. 6 B.B. iron wire, 13,200 volts, wood cross arms, and single phase (two-wire) circuits, parallels, just as they enter the city limits, four of our grounded farmer lines for a distance of only half a mile. We are across the road but our lines are very noisy.

In your opinion could most of the induction be eliminated by the high tension line running in copper wire for this one-half mile with two transpositions cut in at regular intervals?

The material of which the power line is made does not materially affect your inductive disturbance. It will undoubtedly help matters if the power people will transpose their line, provided they also balance it up so as to have no leaks or grounds anywhere.

The final remedy lies in your own hands, and it is in the long run cheaper. It is for you to make your telephone lines metallic, at least for the distance that they are exposed to induction. But you must arrange it so that you never connect one of these metallic lines to a ground-return line without repeating coil between them. If you do not thus interpose a repeating coil, the earth return line will ground the metallic line and bring back the noise.

Trouble in Operator's Talking Equipment.

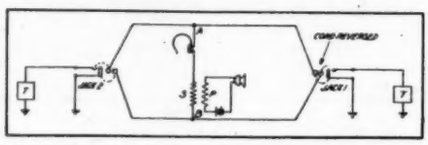
We are operating a magneto board of one position. The board is equipped with double supervision and condensers in all cord circuits, two of which have repeating coils for connecting metallic toll lines to grounded or one wire local lines. Nearly all of our lines are one wire or grounded circuits except about eight The board has a suspension transmitter. All the keys are of the combined ringing and listening type.

Lately we have had trouble with operator's set going dead—that is, the operator is unable to hear anything or to make herself heard over her talking set. The board had an induction coil of No. 14-A type. We have put on a new coil, but it did not help matters any. Would like some one to give me a little advice as to how I can find this trouble and remedy it. Once the board was dead for about an hour, but most of the time it only lasts for a few minutes.

We have had experience with such cases and they are very elusive because they come good again before tests can be completed. If the trouble will stay on for an hour, it is a certainty that it can be tested out and found. An hour is ample time, but all traffic on the board must be stopped.

Sometimes it will be found in the listening key's failure to break contact, all or part of the time, together with a defective line. If this key is on a cord which happens to get plugged up on a heavily ground line, and the contact fails to break, it will leave the operator's set partly or wholly short-circuited. This condition will be known by a heavy side tone in the operator's receiver, but lack of ability to converse with other cord circuits.

As a last resort, make a thorough physical inspection of all the operator's



A Reversed Cord In Plug May Be Cause of Trouble.

wiring, resoldering all joints, replacing all cords and adjusting all key springs. Make sure that all cords are similarly poled (tip to tip) and the same side of the cord to the corresponding side of the operator's set. In one case, the cord at one plug was reversed, as shown in the illustration, so that whenever that particular cord was in use at the defective end, it grounded the wrong side *A* of the operator's set.

The *A* side was grounded at jack 1, the *B* side at jack 2 or any other jack, even on other cords, to which this operator's set was connected. The *A* spring on the listening key at times failed to clear, which brought on the trouble.

Thorough inspection will clear your trouble.

Location of Faults by Wheatstone Bridge on Loaded Lines.

Will you give me in brief, the general practices used in computing the location of faults by the Wheatstone bridge method, where the problem of loading coils is encountered? I would like to know the proper allowances to make when using loaded pairs as a basis for testing, in cases where non-loaded pairs are not available.

All Wheatstone bridge measurements depend upon a known relation between resistance and distance. Without this knowledge, it is impossible to locate faults by this plan.

If a fault be investigated by test and found to be 150 ohms from a certain point, we must absolutely know how many ohms per mile is the resistance of the wire, or how many feet per ohm. Even those forms of Wheatstone bridge tests which give the result as a fraction of the total loop, depend upon the assumption that the wire is of uniform resistance all the way around the loop.

Loading coils complicate the problem only as they increase the resistance of the conductor at certain points. The resistance is no longer uniform from end to end. Therefore you must know the location of every coil and its resistance. This record is not hard to get and will be valuable.

Measure in the ordinary way, obtaining the resistance from the office to the fault. Then add up the resistances of wire and known coils until it equals the measured resistance to the fault. It will save much time if you will in advance compute or measure the resistance from the office to each loading coil.

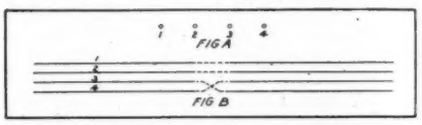
Record this information on a map or wire lead, together with the distance between coils. It is easy by computing the resistance to the fault with the map, to see that the fault is at one coil or between two coils. Now subtract from the resistance to fault the resistances of all the coils between the office and the fault, and then calculate the distance in the usual way.

The Balancing of Paper Insulated Telephone Cables.

Can you give me a few of the important points in balancing paper cables?

Paper cables require balancing to prevent inductive disturbances between pairs and between phantom and physical circuits. Electrostatic capacitance is the factor. The capacitance must be equalized between all the wires in question.

In Fig. *A* let wires 1 and 2 form a physical circuit, 3 and 4 another, while upon



Physical Circuit Arrangements.

them is to be superposed a phantom circuit. In order to have no cross talk between the physical circuits, the capacitances must be in proportion, thus:

$$\frac{C_{13}}{C_{14}} = \frac{C_{23}}{C_{24}}$$

The symbol, C_{13}, is used to denote the capacitance between wires No. 1 and 3. This is balanced up by connecting the lengths of cable, Fig. *B*, so as to neutralize the inequalities, reversing one pair if necessary to preserve or approximate the proportional relation.

In order to have no cross talk between the phantom and either of the physical circuits, the capacitance of wires Nos. 1 and 2 connected as one wire must be the same to wires Nos. 3 and 4. That is $C_{12\text{-}3} = C_{12\text{-}4}$.

The cable is balanced up by proper connection of lengths as described. In any given installation, the total unbalanced capacitance ought not to exceed one hundred micro-microfarads (0.0001 m. f.).

Improvements to System.

The Cass County Telephone Co., of Harrisonville, Mo., has just completed a number of improvements to its system, including the placing of its wires underground, and making additions to its central office equipment.

"Telephony's" Home Study Course for Telephone Men

A Complete Presentation of the Principles Underlying Modern Telephony in All Its Branches—Arranged Systematically So That Regular Reading and Faithful Study Will Qualify Ambitious Men for Higher Positions—Prepared Under Supervision of Stanley R. Edwards—This Section Written by Jay G. Mitchell

Quiz Questions on the Preceding Installment.

645. What is the meaning, in the strict sense, of the words, "toll circuit"?

646. What is the first consideration in designing the circuits for a toll switchboard?

647. Why is the current supply to transmitters often increased in the case of toll connection?

648. What is the simplest form of toll switchboard?

CHAPTER XXV. The Toll Switchboard (Continued).

649. *Combination toll and rural circuits.*—In some cases, operating telephone companies make use of combination toll and rural circuits. The circuit may have been originally a toll circuit between offices with rural subscribers bridged on it later, or it may have been two rural circuits working into different offices which have been connected at their outer ends in order to secure a through circuit between the two offices. It is obvious that such circuits cannot afford the best operating conditions and, as a matter of fact, they are generally makeshifts of a temporary character so far as toll service is concerned.

The telephones connected to such circuits are arranged so that each group may only call one of the two offices. Should intermediate cut-in stations be inserted, it is essential that their ringers be of the same resistance as all the other ringers on the line.

650. *The toll line signal.*—In the toll cut-in station the toll line signal is an ordinary polarized telephone ringer. Owing to the fact that the ordinary polarized ringer is very reliable and may be operated over line conditions that are too severe for satisfactory results with the drop type of signal, it has also been employed for the line signal in some of the older and smaller toll switchboard equipments.

For this service the ringers are mounted on a strip suitable for placing in the apparatus panel of the switchboard. They are then wired to the two sides of the line circuit through the spring contacts of a double cut-off line jack. When the plug is inserted, the winding of the ringer is disconnected from the toll line circuit.

In many cases the ringer toll line signal is equipped with a shutter released by the slightest movement of the clapper rod. This shutter, like that of the magneto drop, may be equipped with night alarm local contacts. While this type of signal is very common on the shorter long distance and rural lines, as well as on local lines in some cases, conservative modern practice calls for the use of drop or lamp line signals for toll switchboards.

The modern switchboard drop, with short air gap and long latch level is a very satisfactory device, either mechanically or manually-restored. It is well within the limits of the truth to say that any toll line over which the modern type of efficient switchboard drop cannot be operated, is not suitable for furnishing satisfactory long distance transmission.

In many of the larger toll switchboards the type of self-restoring drop shown in Fig 96 (TELEPHONY, November 20, 1915) is used as the toll line signal. The restoring winding of such a line signal is connected to the third wire on the sleeve of the jack. This completes a battery circuit through the restoring winding when the sleeve of the plug makes its contact with the sleeve of the answering or multiple jack.

In still more modern toll switchboard equipments, this type of self-restoring drop is used as a relay and closes the battery circuit through the toll line lamp, associated with the answering jack when the shutter falls. The principle of such a line relay is shown in Fig. 125 (TELEPHONY, January 29, 1916) in which the line lamp circuit is controlled by the contact springs marked "local contact" and the restoring circuit is controlled by the sleeve of the answering and multiple jacks.

The relation of the jack sleeve, the plug sleeve and the restoring winding of this type of line relay or drop is shown in theory in Fig. 200. It is to be noted that when this type of drop or relay has been restored by the insertion of the plug in the jack, the restoring circuit is broken at the shutter contacts. This effects some economy in the consumption of current from the common battery and is less likely to cause injurious heating of the restoring winding. At the start of the restoration of the shutter, this circuit is closed; but as the shutter reaches its normal position, the restoring circuit is opened. For more complete discussion of this feature see section 235, TELEPHONY'S Home Study Course for Telephone Men, November 20, 1915.

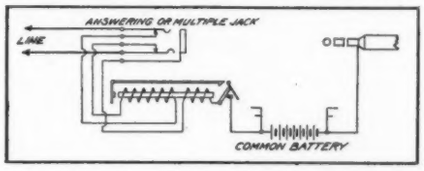


Fig. 200. Toll Drop, Electrical-Restoring Circuit.

651. *Direct pay-station toll-line connection.*—In many small magneto telephone offices, the annual amount of the toll traffic is insufficient to justify elaborate toll installations while, at the same time there is a demand from important subscribers for access to the through toll circuits. In such cases, the exchange pay station telephone is often connected directly to the toll circuit and provision made at the same time so that the switchboard operator may have access to the circuit. One of the possible arrangements to accomplish this is shown in Fig. 201.

The two sides of the toll line, *A* and *B*, are connected, through the normally-

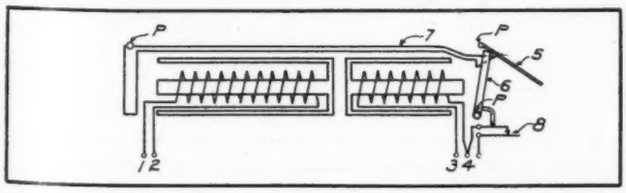


Fig. 96. A Popular Form of Electrically-Restored Drop.

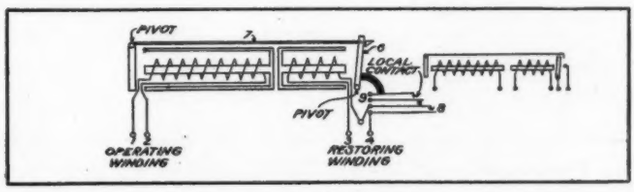


Fig. 125. Alternating Current Relay of Self-Restoring Drop Type.

closed contact, 5, of the key, *C*, and the normally-open contact, 6, of the line jack, *D*, with the terminals of one winding of the repeating coil, *E*. The pay station telephone, *F*, is connected directly with the toll line through the normally-closed

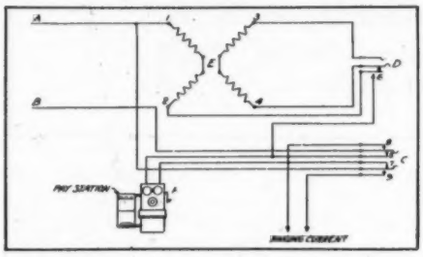


Fig. 201. Toll Pay Station with Switchboard Tap.

contacts, 5 and 7, of the key, *C*. The outside contact springs of the key, *C*, are connected as shown with terminals of the ringing generator.

It is essential, with this arrangement, that the switchboard operator be within easy hearing of the pay station telephone bell to assure her attention to all incoming calls.

652. *Operation of pay-station toll-line equipment.*—Upon the receipt of a signal over the toll circuit, the operator answers by inserting the answering plug of a cord pair into the toll line jack, *D*. The insertion of the plug mechanically displaces the ring spring slightly and closes the normally-open contact, 6. This completes a circuit which inserts the repeating coil, *E*, into the toll circuit between the operator and the pay station telephone.

The repeating coil, E (known as "talk through" type), is of the most efficient type for speech transmission as the necessity of ringing through it on the toll circuit is eliminated by the ringing key, *C*, belonging to the toll circuit equipment. The toll connection may then be completed by the other cord of the pair if the called party is a subscriber. If not, the called party may be directed to the pay-station telephone, *F*, when the withdrawal of the plug from the line jack, *D*, will clear the repeating coil from the circuit.

Should the call be outgoing, the operator would use the key, *C*, to ring out

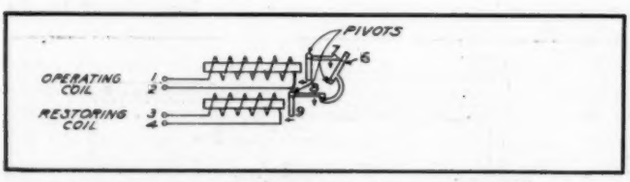


Fig. 97. Another Type of Electrically-Restored Drop.

on the circuit. When the key, *C*, is operated, the pay station telephone, *F*, is disconnected from the toll circuit at the contact points, 5 and 7, and the toll circuit is connected directly with the ringing current source through the key contact points, 8 and 9. By the use of such an arrangement, the through toll circuit is left free of local equipment with the exception of the ringer of the telephone, *F*.

This ringer being, presumably, one of a very few, may be made of extremely high impedance so that the transmission loss due to its attachment to the circuit, when the pay station to which it belongs is idle, is reduced to the minimum. While the standard telephone ringer is more sensitive to ringing current than the ordinary drop, it must be borne in mind that the loss in transmission, due to the properly designed drop, is less than that due to the ringer when bridged across the working circuit.

653. *Essentials for satisfactory toll transmission.*—In long distance operation, the essential thing is conservation of the strength and characteristics of the voice-carrying currents. It is obviously essential, also, that satisfactory signaling be possible but when satisfactory signaling has been attained, the arrangement must be carefully scrutinized for possible causes of loss in transmission. The causes, which in local circuits are continuously in operation to produce transmission losses, are greatly magnified in their effects when present in long distance circuits and require correspondingly increased vigilance to assure the possibility of satisfactory transmission.

The self-restoring drop of the type shown in Fig. 97 is perfectly satisfactory to toll equipment. Any type of drop, provided it is sufficiently sensitive to operate under the line conditions, may be employed as the toll line signal. It is essential, however, that the toll line signal be of a type that preserves the toll line circuit free from all local grounds or battery connections that are or may be made common with other circuits. For instance, the target signal shown in Fig. 99 would not be suitable for use as the line signal for a long distance circuit cut into more than one other terminal.

When the line tap on which such a signal is used, is idle, the common connection through the winding of the signal would place the two sides of the toll line in electrical connection with disturbing elements.

Theoretically this would be productive of no trouble if the two halves of the signal winding were exactly balanced as to resistance, inductance, reactance, etc. Practically it would be almost certain to cause trouble. For that reason its use is not permissible as a toll line signal.

(To be continued.)

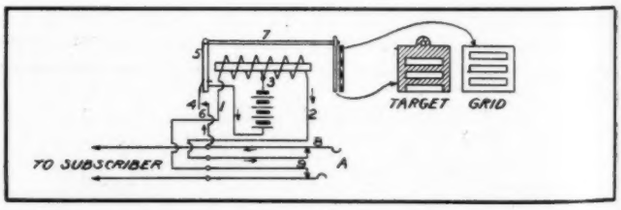


Fig. 99. Electrically-Released Magneto Gridiron Signal.

Convention and Operators' School at Noblesville, Ind.

The committee on arrangements of the Central Indiana Independent Telephone Association has announced the following program for the convention and operators' school to be held at the court house in Noblesville, Ind., April 17:

MORNING SESSION.

Welcome address by Honorable E. E. Cloe, judge of the circuit court.

Response, by Jesse W. Weik, president of the Greencastle (Ind.) Telephone Co.

"Insurance," by Lynton T. Block, president of the Utilities Indemnity Exchange, St. Louis, Mo.

"Making Friends for a Business," by J. K. Johnston, Indianapolis.

AFTERNOON SESSION.

"New Constitution," by Rev. C. M. Byerly, president of the Kingman Telephone Co., Boswell, Ind.

Election of directors.

The operators' school is to be conducted by W. S. Vivian, of Chicago, secretary-treasurer of the United States Independent Telephone Association, assisted by C. E. Doolittle, traffic manager of the Citizens Independent Telephone Co., Terre Haute.

Former Trade Commissioner Hurley on Trade Journals.

Edwin N. Hurley, who recently retired as chairman of the Federal Trade Commission, says regarding trade journals in his book, "The Awakening of Business":

"American business men do not realize the value which trade journals and technical magazines may be to them in increasing the efficiency of their factories and giving them a broad, comprehensive view of their business. Our trade journals and technical papers are the best in the world, and they should be encouraged and supported by our business men.

Copies should be placed where employes can see them, and they should be urged to read and study them. These papers are preaching the gospel of sound business on practical lines, and are helpful not only to business, but to the country as a whole."

Texas Association Plans Work

At Special Meeting of Officers and Directors, Co-operation Was Pledged for National Defense — Membership Campaign to Be Inaugurated at Once — Increased Service to Members — Ten District Meetings to Be Held

Pledging in all ways possible the assistance of the Texas Independent Telephone Association to Vice-President F. B. MacKinnon of the United States Independent Telephone Association, in his capacity as a member of the committee on communications, Council of National Defense, the officers and directors of the Texas state association, in a special meeting at Waco, Texas, April 4, instructed their secretary to notify all Independent telephone companies in Texas they will be called upon, in case of need, to co-

President Still in a Resting Position.

operate with the state and national association to carry out the desires of the government.

Mr. MacKinnon's recent communication to the directors of the national association was read, and the Texas association has promised that Texas Independent telephone companies will do their part in case of need.

Those present at the meeting included President R. B. Still, of Tyler; the two vice-presidents, A. J. Combs, of Haskell, and F. W. Greber, of Brownwood; Secretary E. C. Blomeyer, of Waco; Treasurer E. M. Powell, of Dallas; Membership Secretary L. S. Gardner, of Waco, and directors, J. Y. Rust, of San Angelo; C. D. Longserre, of Bardwell; R. A. Ward, of Pflugerville, and J. W. Ozment, of Palestine.

The meeting was in session all day long, working on many matters of importance to the Texas association and developing plans for the coming year.

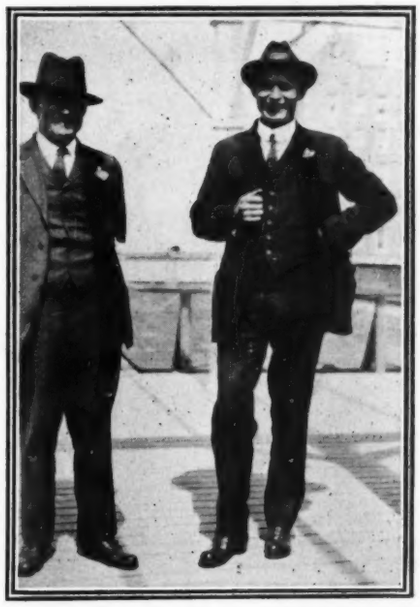
A meeting of the membership committee was held in Waco the same day, at which there were present Chairman L. S. Gardner and members, Sam H. Shutt, of Temple, and Oscar Burton, of Tyler. Plans for the enrollment of the 500 members during 1917, that the Texas association is determined to obtain, were discussed at length, and a membership campaign was ordered, to be begun at once.

Ten district meetings were ordered for 1917, such meetings to be held in Tyler, Waco, Brownwood, Denison, Austin and Greenville, the places for the other four to be selected by the officers. The 1918 convention was set for March, between the 8th and 23rd of that month, the place to be finally selected by the officers.

A large map of Texas was ordered made, upon which is to be designated every Independent telephone exchange in the state, to be used by the membership committee.

A number of measures to increase the service given by the association to its members were agreed upon. The president and secretary were instructed to notify all members that the association would undertake to represent member companies in the adjustment of any questions between them, or negotiate the adjustment of any grievance a member company may have against any company in the state.

A committee was appointed to confer with the larger transmission companies in



New Directors Longserre and Ward.

the state, for the purpose of agreeing upon standards of construction of parallel telephone and transmission lines. Other suggestions were discussed and some adopted.

After adjournment of the meeting, the visitors were the guests of the Texas

Officers and Directors of Texas Independent Telephone Association at Recent Meeting.

Telephone Co. of Waco at dinner at Raleigh Hotel. The next meeting of the officers and directors will probably be held in Galveston, in July. The Texas association is a live organization, and the officers and directors of the organization are working hard to make 1917 a banner year.

In one of the accompanying illustrations is reproduced a photograph taken of the officers and directors in attendance at the meeting on the roof garden of the Texas Telephone Co. Those in the front row, kneeling, from left to right, are: Vice-President F. W. Greber and Treasurer E. M. Powell. Those in the back row, left to right, are: Directors J. Y. Rust, C. D. Longserre and R. A. Ward, President R. B. Still, Membership Secretary L. S. Gardner, Vice-President A. J. Combs; Oscar Burton, member of the membership committee; Director J. W. Ozment.

Association to Protect Independent Interests in California.

The first step in the organization of an association of Independent telephone companies of Southern California was taken at a meeting held recently at the University Club, Redlands, Cal. Representatives were present from all parts of the south and the companies involved represent 25,000 telephones.

The association is being organized to protect the interests of the telephone companies which have no connection with the Bell system. The men present at the first meeting were:

A. Wardman, Whittier, Rivera and Downey; P. A. Gould, Redondo Beach; D. S. Barker, Pomona Valley Telephone & Telegraph Co., operating at Pomona, Chino, Lordsburg and Claremont; J. M. Baldwin, Monrovia and San Fernando; M. Whittaker, Santa Monica Bay Home Telephone Co., Santo Monica; R. E. Thompson, general manager of San Diego (Cal.) Home Telephone Co.; Mr. Anderson of the Huntington Beach (Cal.) Telephone Co.; W. E. Farman, Sierra Madre; J. O. MacDonald, Gardena, and C. A. Rolfe of the Southwestern Home Telephone Co., operating at Redlands, Cal., and in Banning, Beaumont, Hemet and San Jacinto.

Operators' Schools Conducted by the Iowa State College.

Better telephone service for Iowa is the big aim of the 14 two-day telephone operators' schools being held this spring over the state by the engineering extension department of the Iowa State College, co-operating with the telephone companies.

This year the schools are booked at Washington, Fairfield, Oskaloosa, Marshalltown, Cedar Rapids, Waterloo, New Hampton, Mason City, Estherville, Fort Dodge, Le Mars, Manning, Shenandoah, and Des Moines. At the first four towns, where schools have already been held, an average of more than 30 girls attended. This means that by May 1 more than 400 operators of the 2,000 in the state will have received up-to-date telephone instruction.

Under the direction of Miss Anne Barnes, the girls are taught the best methods of putting through long distance calls, standard phrases and other phrases of operating, tending toward better service to the patron.

Telephone Men to Form Signal Corps Reserve Companies.

With the object of preventing the mistakes that were made abroad at the outbreak of the war in Europe where skilled workers, absolutely necessary for the needs of their country, were drafted for work in the field, later to be sent back from the front to do the work for which they were peculiarly fitted, the New England Telephone & Telegraph Co. has plans under way for efficient patriotic service.

Arrangements have been made to form two signal corps reserve companies to serve in the army and a similar corps to serve in the navy. Salaries of all who have enlisted in other branches or who will enlist in the signal corps will be assured for the present.

Technically skilled telephone employes required by the government will be given leave of absence from the company, as will others who serve the country.

Every effort is being made to ascertain as soon as possible the number of employes needed in the various branches of service and employes are asked until this information can be collected to consult with their superiors before enlisting.

Arrangements have also been completed by the Pacific Telephone & Telegraph Co., of San Francisco, Cal., and a number of other telephone companies for the formation of signal corps reserve companies.

Maryland Company Offers Service to Government at Half Price.

With the country now in a state of war, the Chesapeake & Potomac Telephone Co., of Baltimore, Md., proposes to do its "bit" by supplying service to the state and federal governments at half price. On March 27 the company filed a request with the public service commission for permission to supply such service. The petition stated that "the discount is offered because of the present emergency and it is therefore desired to put the rate into effect at once." Without hesitancy the commission entered an order in compliance with the request. The effect will be a big saving to the state, as it is anticipated that there will be a tremendous increase in the use of the telephone following the mobilization and disposition of the troops.

Quarterly Meeting of Western Pennsylvania Association.

The Western Pennsylvania Independent Association has announced that the quarterly meeting of the association will be held at the Fort Pitt Hotel, Pittsburgh, Pa., on Thursday and Friday, April 26 and 27.

Practical Subjects—Discussions

Automobile Maintenance and Cost Data of Kentucky System.

Detailed figures on the cost of operating 16 Ford automobiles during 1916 have been worked out by W. M. Brown, general auditor of the Central Home Telephone & Telegraph Co., of Louisville, Ky., and show a general average mileage cost of operation to be .039 cents; which is increased to .0585 cents when depreciation and insurance are figured in.

These figures cover every cost in connection with the operation of these 16 cars—two of which have been converted into one-ton trucks. At some points in the state the cost per mile is admittedly higher than it should have been—the excessive cost is to be explained in part by bad roads, an item that should be considered when the report is examined.

At that the company has reached the conclusion that, taking the results obtained into consideration, the cars are cheaper than horses and mules owned by the company, and very much less than the cost of service when livery turnouts are hired. The company still has a good many horses and mules, but is not buying any more of them.

A good deal of credit is given to the automobiles for the success of the efficiency compaigns which the Central Home is conducting from year to year. There are many advantages gained from employment of automobiles which can hardly be shown in a mile-cost tabulation, and these advantages have been lumped as the "results," which, considered with the comparative costs, have determined the company to use the cars to the exclusion of the horse-drawn equipment. The service is typical telephone service and, it may be stated, the character of the country roads and city streets traversed is typical.

The company is substituting Ford runa-

Buy Your Insurance at Cost

Eliminate the Middle Man

Don't you know that the most progressive telephone men are insuring in the

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LYNTON T. BLOCK, Attorney and Manager

Railway Exchange Building - St. Louis, Missouri

bouts with a small commercial body attached back of the seat for the horses and wagons, to be used in clearing trouble at the various plants of the company. The converted trucks are being placed in service where the line order wagons have heretofore been used.

When the company first began using cars several years ago it experienced a great deal of difficulty in having reliable records kept of the expenses in connection with operating them. It has been found that the only sure way to get reliable records is to require a daily report from whomever is using the cars, these reports to show the mileage, use of gasoline, oil, tires, etc. The records for 1916 are, however, complete and accurate, and, Mr. Brown is of the opinion that with this record as a guide, the 1917 record will show up better than was the case in 1916.

The recapitulation of garage expenses for the year 1916 is given in the accompanying table.

Number of cars.	Exchange.	—Gasoline— Amount.	—Gasoline— Cost.	—Oil— Amount.	—Oil— Cost.	Cost of tires and tubes. Number and kind of casings.	Cost of tires and tubes. Cost.	—Repairs to— Tires.	—Repairs to— Car.	—Repairs to— Speedometer.	Rent of garage.	Other miscellaneous expenses.	Total cost.	Number of miles.	Cost per mile.	Miles per gallon of gasoline.	Cost per mile including depreciation and insurance.
1	Bowling Green, Ky.	1,302	$ 276.81	101¼	$ 37.09	15	$ 178.12	$ 34.65	$ 74.45	.....	$ .75	$ 79.15	$ 681.02	16,800	$0.0405	12.9	$0.0543
1	Carrollton, Ky.....	244	48.65	8	3.90	..	4.80	3.25	2.00	$ 0.53	4.75	11.98	79.86	2,171	.0367	9.0	.0571
1	Cynthiana, Ky.....	923¼	210.54	26½	13.08	7	85.26	6.50	5.30	2.00	18.00	84.33	425.01	12,964	.0327	14.0	.0500
1	Frankfort, Ky.....	1,233	291.82	110	32.56	17	219.37	8.00	100.50	1.71	18.00	35.50	707.46	17,550	.0403	14.2	.0527
1	Lawrenceburg, Ky..	633	134.75	10	2.88	14	155.45	6.67	36.90	3.36	24.00	21.46	385.47	9,913	.0388	15.6	.0607
1	Marion, Ky.....	433	95.28	37¾	16.03	5	75.85	5.60	9.57	.....	17.50	42.10	261.93	5,585	.0468	12.9	.0707
1	Maysville, Ky.....	777½	168.45	47½	16.05	8	84.93	8.60	4.75	.70	36.00	84.93	404.41	10,833	.0373	13.9	.0552
1	Nicholas, Ky.....	1,030	227.53	46¾	23.90	18	195.39	35.78	95.15	14.74	8.25	26.39	627.12	12,970	.0483	12.6	.0661
1	Owensboro, Ky.....	782	167.21	23¾	7.76	3	53.70	6.65	6.75	3.10	60.00	17.05	322.22	10,179	.0317	13.0	.0536
3	*Paducah, Ky.....	2,700	524.75	152	50.23	25	287.52	32.68	196.77	14.50	70.85	41.55	1,218.85	30,199	.0403	11.1	.0585
3	*Paris, Ky.....	1,436	327.87	74½	26.76	14	156.73	16.10	162.20	11.00	18.50	181.00	900.16	23,438	.0384	16.3	.0582
1	Russellville, Ky.....	538	125.74	31	17.45	7	91.01	7.90	5.05	.....	30.00	42.45	319.60	6,090	.0524	11.3	.0913
16	Total	12,031	$2,599.40	635	$247.69	133	$1,588.12	$172.38	$699.39	$51.64	$306.60	$667.89	$6,333.11	158,692	$0.0390	13.1	....
	Cost per mile.....		.016		.0015		.0099						.0390				$0.0585

*Truck cost included.

Net cost per mile, $0.0585.

Depreciation	$2,060.00
Insurance	823.54
Taxes	81.50
Total	$2,965.04

Recapitulation of Analysis of Garage Expense of the Central Home Telephone & Telegraph Co., Louisville, Ky.

Sunshine and Shadows Along the Telephone Trail.

By Well Clay.

High swings the hot sun overhead,
The bitter winter winds have fled,
The snowy drifts have vanished quite,
No longer does it freeze at night.
The rural lines are strangely still
As the farmer goeth forth to till
The mellow soil the live-long day,
To get the wherewithal to pay
The multitudes of little bills
Which accumulate with winter's chills;
Among the least, of which in cost,
Is the telephone that's used the most.

One of the chief joys of living through a long, hard winter is that it seems so nice when it is over. It's like the man who said that a pounded thumb was not all bad because it was such a relief when the pain stopped that it made one happy again. But it's all over now and everything is lovely and serene.

All we have to bother us now is war with Germany. Outside of that we are getting along all right. Of course a telephone man in a neighborhood that is half German and half the other kind, has a nice time and no trouble, provided he can please both with his expressed sentiments. The only safe way for him to steer a clear course in such a case is to confine his remarks exclusively to the weather and the state of the roads. Telephone service is a fine school for the diplomatic service.

The effect which the war will have on us telephone companies is hard to say, but so far all we have noticed is that we have a greatly-increasing list of people who are awaiting their turn to have telephones installed in their homes. Also it seems that we have less and less difficulty in collecting our money.

Most of our farmer patrons, when they come in to pay their bills, are more apt to peel a "twenty" off their "roll" than otherwise. That is a little different that it was a few years ago. The banks are filled to overflowing (with other folks' money—anyhow it's not ours) and farmers are very sure that, come what may, the present season they will be able to get top prices for their products because there will still be a world shortage, no matter what sort of a bumper crop may materialize.

The farmers of this one county in which we operate, have in the banks to their credit over five millions of dollars. Think what results a judicial expenditure of this sum would have obtained if Columbus could have had it in his drawing account when he came over to select some suburban property before the rush set in. He could have bought the whole country from the Arctic Circle to the Tropics, but now it would scarcely purchase a dozen congressmen or get its possessor beyond the door mat of the society circle.

It was certainly lucky for Columbus that he did not know what he missed by not coming to visit the interior of our great country. Think of the possibilities! He could have operated a telephone system at a dollar a month per station, and made money at it, with raw material at the price he would have found it at that time. That time, alas, is no more and Columbus let his one great opportunity slip.

But to get back to the subject—if this letter has one—it seems to me that at least for some months to come there will be expansion in the telephone business to a considerable degree, if we accept all the business that offers.

If our patrons are making money—and most of our patrons are farmers and making money as never before—it stands to reason that a great deal of that money will be spent. In the case of farmers, all the money they spend, as a general rule, is spent on their farms, homes, and for personal conveniences and enjoyment.

Telephones are, of course, a convenience, if not a positive joy, so we will get some of the first orders which are given for extras out of the big new crop of prosperity, because the telephone is really the first outward expression of advancement. The piano man, the auto agent, the gold-brick vendor and the tax gatherer will all come in for a share of this war-created wealth, somewhere along the way, but the telephone crew will be invited into the farm-yard first.

There is only one question for us to solve. That is, all things considered, how near the price which we are entitled to get for the service, can we charge and collect with the least amount of opposition? Will the rates which have held in the past be adequate?

I am afraid that they will not, as there is already a heavy load of overhead added to the cost of operation which we knew not of five or more years ago.

The latest ideas in folding door booth construction are found in The Yesbera Line. There are many patented features; to be fully posted on telephone booths you must know about them.

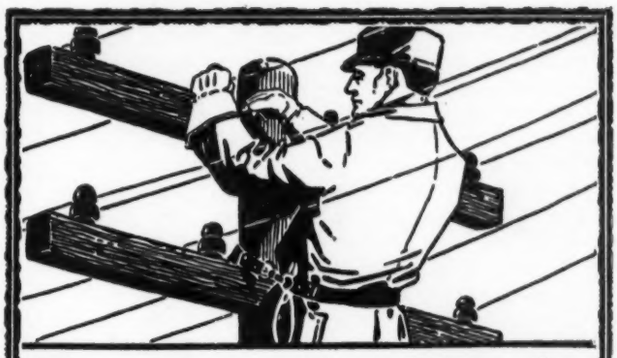
YESBERA
TOLEDO

The perfection of operation is a big feature of these booths. The small space needed to operate make them the *only* booth for many places. The improved ventilation, and the impossibility of injury are points you should know about.

Send For Our New Catalogue

We have a new catalogue on the press which we will send, gratis and without any obligations, to those in the telephone business. Send in your name now, so as to get a copy.

The Yesbera Mfg. Co.
2308 Albion St. TOLEDO, OHIO



Tested to resist 4,000 volts

Rezistol leather has been tested to resist a current of 4,000 volts. It is an extra quality work glove that gives the most protection to the hands of telephone and telegraph linemen.

Grinnell REZISTOL Gloves

Extra reinforcements where the greatest strain comes. Soft and pliable—and washable in soap and water or gasoline. The most economical glove for the mechanic.

You are sure to find the glove you need from the Grinnell line—over 900 styles. Gloves for dress, outdoor wear, motoring, sports. Mittens of every description. Work gloves that wear like rawhide.

New booklet free
A copy of "Glove Styles" will be sent you free. Please mention dealers name.

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OUR EXTRA HEAVY DOUBLE GALVANIZED WIRE INSURES
HIGHEST EFFICIENCY.
LONGEST LIFE.
LOWEST COST OF UPKEEP.

It's easy to determine, TEST IT.

As wire will test best, so also will it last best and give better satisfaction while it lasts.

We guarantee our wire to conform with all standard specifications as well as to be satisfactory to the purchaser.

IT'S THE ONE BEST PROVEN BY TEST.—*TRY IT.*

Handled by most representation jobbers and supply houses.

Write for samples, test and compare.

INDIANA STEEL & WIRE COMPANY
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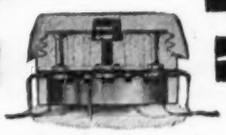
COX



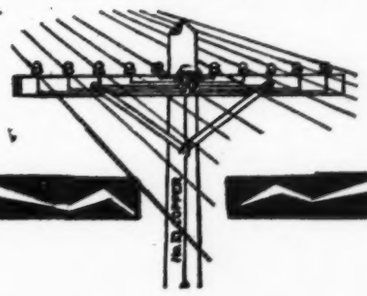
Multiple Lightning Arrester

THE COMMON SENSE ARRESTER
—Installed on the poles and distributed along the lines where the lightning strikes.

Do you realize what a relief it is after a lightning storm to find that your lines show **NO FUSES BLOWN, NO CARBON GROUNDS?** Your **SERVICE** has been **PROTECTED** as well as your **EQUIPMENT** and there is no demand for rebate.

One Dozen ($15.00) will protect 100 telephones.

COX LIGHTNING ARRESTER CO., Eaton, Ohio



That there will be more, and probably very much more, added in the near future is more than likely.

In the final analysis, in its endeavors to collect some of the costs of the war from those sources which have and are receiving the most benefit therefrom, the telephone companies will be the medium through which the government will reach the pocketbooks of the farmers through taxes on their telephone service.

If this is true, and it is put into practice, there must be some means devised and placed into almost immediate operation whereby the added costs may be expeditiously charged to the current accounts of the patrons lest the accumulated surpluses of less strenuous times are not seriously depleted or wiped out absolutely. Some companies have no surpluses at all and in their cases actual capital impairment is sure to speedily result.

Other companies have surpluses on paper only, without any actual cash. In such cases where the money was spent for betterments and credited to the surplus account instead of being paid out in dividends, there will be a heavier charge for depreciation than if the money had not been so invested, for the reason that depreciation is figured on the value of the plant instead of on the capital stock.

I believe it is comparatively rare that a telephone company has real hard cash surpluses on hand, immediately available, for use in times of emergency—that is, in any considerable amount—so there is going to be a whole lot of scurrying for cover pretty soon.

In a case where there is much business awaiting for a telephone company to take care of, it is usually easy to raise money to finance the necessary additions and extensions. So I believe that now is the best time of all for telephone companies that need larger returns for service and more capital for development, to sail right in and make the necessary adjustments and arrangements while the people as a whole are thoroughly in a mood to take price-raising as a matter of fact and necessity rather than looking upon it as an unwarranted attempt to rob them, as has sometimes been the attitude in times past.

APHORISM: It is hard to shape a cold iron to your needs.

A Florida Man's Experience With 100 Per Cent. Collections.

I have been reading with interest the subject of 100 per cent. collections written by W. M. Brown, auditor of the Central Home Telephone & Telegraph Co. of Louisville, Ky., and I heartily endorse the statement written by him which appeared in the March 17 issue of TELEPHONY. I wish to state that that is just what I am following up.

When I came to Lakeland, Fla., ten years ago, I found everything in good condition but the telephone collections. There was a big balance on the books and I was told by some of our employes, "You can't make them pay up—they pay when they get it." I listened to all of this talk—some of it from our patrons.

After I got located and things were straightened up, I started out with a newspaper notice that where telephone bills were not paid by the 15th of each month, service would be discontinued. We had a stamp made which read like this: "Having called personally to collect this bill, it is now due and payable at the office of the company on or before the 15th day of this month or service will be discontinued." When the collector called and did not get his money, he left the bill with the above notation stamped on it.

This started the ball roiling. It had the desired effect and we carried out our threat to disconnect for non-payment of rental. Right now we are collecting 100 per cent. out of 1,000 subscribers. In fact, within three years after starting on this collection campaign we were requested by the Florida Railroad Commission to collect our bills for rentals in advance. We had hardly any trouble.

We now rebate 25 or 50 cents and all of our bills are collected by the 15th of each month in advance.

As Mr. Brown states, some managers say they leave the matter of collections up to their bookkeeper or cashier and I have heard this same talk myself. This view is wrong for the collections are a manager's greatest assets. If he hasn't money he must go to the bank and borrow it, paying 6 to 8 per cent. interest for it when his patrons should pay it, if he would just take the stand for it.

Looking over collections and bills in my exchange is a daily morning routine, and as the 15th draws near our bookkeeper calls up the delinquents and reminds them of their bills.

Of course, when I took this stand I was an unpopular man. Some patrons wanted to get up a petition to have me removed; in fact, one was started but not presented although it was all ready. I heard of this and informed our general manager. He sent a representative up to see me and I told him who started the petition and led him to the right person, because all I did was to watch people's bills.

Well I won out and very often well-known, prominent telephone men say, "I wish you would come down to my exchange and make them pay." They can, if he will take the stand for it, but to do this it is necessary to give 100 per cent. service.

Our exchange is common battery, automatic ringing and recall, secret service and our trouble is kept up 100 per cent. every day. I will say further we have made a steady gain in subscribers since we enforced our collections.

A. D. Leonard, manager,
Peninsular Telephone Co.
Lakeland, Fla.

A Typical Communication from a Rural Subscriber.

The following letter which was received by a Minnesota telephone company, is typical of the correspondence received by telephone companies, from time to time, from rural patrons:

"I have bin auth all day to day, To tray to fix up the tilephone Lines, I hade Petter Carlson, Along with his tieme, And we have fixed up all ve can, Bath the Trobbles Moust be with the Phones,

"Please sand a men at wounce to locke over the phones, as I have no exsperiances with the instruments, the lithning hade Splitted some Poles, and we found a Grounding, Whare vi putted in a Post, Bath the Poles for Mrs. John Erikson, I could not Do anney ting with it, The Poles stans now on the Road, and have to be moved, Bath whan she Cicks now, How could i Move tham 1½ rad farther in to the Fiels, Newly Brocken, or to puttham on the ather side into a mens fine while, I simple hade to let tham stane whare the Stode, Bath whan the State Road will be Graded the all will comme in the Dish, and will have to be trowd auth, now i in close the Bill for me and Carlson, Please order tham paid as soan as you gets in to Newfolden."

Pole Setting in Fine, Dry Sand in Arizona.

A novel and effective means has been found for digging holes for the poles of the new transmission line which the Southern Sierras Power Co. is building across the desert from El Centro, Cal., to Yuma Ariz., says the Journal of Electricity.

The sand is so fine and dry that it runs almost like water. To obviate the difficulties of digging under such conditions, the engineers of the company have devised a collapsible cone, which tends to sink into the ground by the weight of the sand and at the same time keeps the sand out.

A frustrum of a cone in about the proportions of an 18 in. top, 36 in. base and 72 in height, is made of galvanized iron sections hinged so as to collapse inward. This is placed on the ground and as the sand is excavated it quickly sinks into the hole. It is then collapsed, an iron cylinder dropped inside, the cone is withdrawn and the pole placed in the cylinder, sand being shoveled into the surrounding space to hold the pole in position.

The purpose of the cylinder is to protect the pole from the effects of the drifting dunes characteristic of this country.

Trouble Detectives!

PIGNOLET Portable Testing Meters will locate any kind of trouble besides measuring volts and amperes; will also determine resistance of coils, lines, ringers, etc.

VOLTMETERS
AMMETERS
VOLT-AMMETERS

Suppose you let us send you a copy of the PIGNOLET Catalogue. It's worth while.

L. M. PIGNOLET
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Medal Panama-Pacific International Exposition

DON'T LET LIGHTNING WIPE YOU OFF THE MAP

PROTECT YOUR EQUIPMENT PERMANENTLY WITH

ARGUS LIGHTNING ARRESTERS

"The Field's Standard of Protection"

FOOTE PIERSON & COMPANY, Inc.
160-162 DUANE ST. NEW YORK CITY

QUICKER THAN LIGHTNING"

Quick to the Scene of Action

Washouts or wind-storms bring the poles to the ground and wires with them—just at the time when the roads are heavy and almost impassable.

Subscribers will condone no interruption of service—despite all adversities your circuits must be closed.

G-B Trucks shield your reputation for service in the face of emergencies. From crank handle to tail light they embody reliability in every detail of construction.

Before you buy **any** truck, find out what kind of a guarantee you get with it. The G-B is warranted for **one year** (not just 90 days) with an additional **guarantee** on the **transmission,** the **springs** and the **radiator for the entire life of the truck.**

Send for our large 32-page catalog and special information on what we are doing for other telephone companies.

Gramm - Bernstein
Motor Truck Company
Manufacturers of High Grade Worm Drive Motor Trucks—1 to 6 Tons
LIMA, OHIO

Biographical and Personal Notes

George Wm. Robinson, president of the Tri-State Telephone & Telegraph Co., of Minneapolis, and St. Paul, Minn., is a native of Maine. He was born in Thomaston, August 16, 1866, and received his

George Wm. Robinson.

education in the public schools of that town.

In January, 1887, Mr. Robinson became assistant secretary of the Union Investment Co., of Kansas City, Mo., severing his connections with that company in 1891 to go with the Inland Grain Co., as secretary and treasurer. He remained with this company until 1899 and for the next two years was associated with the Missouri National Bank. From 1901 to 1904 he was treasurer of the C. D. Grigg Tea & Coffee Co., of St. Louis.

Mr. Robinson entered the employ of the Tri-State Telephone & Telegraph Co. in 1904 as general auditor. In 1910 he was made vice-president and treasurer and since 1914 he has been president of the company.

The growth and progress of the Tri-State system—the largest Independent system of the Northwest—is too well known to TELEPHONY's readers to need exposition here. During the past year, the Minneapolis and St. Paul exchanges have been cut over to full automatic equipment, complete descriptions of the new exchanges having been published in TELEPHONY of June 3 and December 21, 1916.

Those who are acquainted with Mr. Robinson understand the reason for the growth of the Tri-State company in recent years. Mr. Robinson, himself a hard worker, has associated with him workers who are full of enthusiasm. He is particularly adapted for the position he fills as leader of the company.

For many years Mr. Robinson has been active in Independent association affairs, as director of the old National Independent Telephone Association and the Independent Telephone Association of America, and as vice-president and director of the present United States Independent Telephone Association.

Mr. Robinson is a member of the Minneapolis Civic and Commerce Association, the St. Paul Association of Business Affairs, the Minneapolis Club, the Minnesota Club, the St. Paul Athletic Club, the St. Paul Automobile Club and the White Bear Yacht Club.

Frank Ross Holt, manager and owner of the Osage Telephone Co., of Osage, Okla., was born near Savannah, Tenn., on February 23, 1882. He received his education at the Normal School at Peabody College and the University of Nashville, Nashville, Tenn.

As partner in the firm of J. W. Holt & Brother, he built the telephone plant at Cold Springs, Okla. He was connected with the telephone company at Cold Springs from 1910 to 1913, teaching in the rural schools part of the time. He also was employed with the Roosevelt Telephone Co., at Roosevelt, Okla., for a short time.

In 1913 Mr. Holt went to Osage in his present capacity, and has been there since, with the exception of partial service as substitute railway mail clerk for about 14 months, from which service he resigned in February, 1916.

Prior to going to Oklahoma, Mr. Holt served in the United States revenue service, in the collector's office, and as storekeeper-gauger from 1903 to 1910, in the district of Tennessee.

Mr. Holt is a member of the Oklahoma Independent Telephone Association, in which he became interested in the latter part of 1913.

S. A. Lindsey, president of the Gulf States Telephone Co., Tyler, Texas, was recently honored with the appointment by the Federal Farm Loan Board at Washington, D. C., as treasurer of the Farm Loan Bank of Houston, Texas.

J. C. Kelsey's many friends in the telephone field will sympathize with him in the death of his mother. Mrs. Kelsey passed away Sunday, April 8, in Hiawatha, Kan., and the funeral was held on April 10.

Ed Rayburn, manager of the Cumberland Telephone & Telegraph Co. exchange at Dixon, Ky., is in an Evansville, Ind., hospital suffering from injuries caused when a telephone pole fell on him. Mr. Rayburn was engaged in emergency work and had climbed a 25-ft. pole which broke at the ground. He fell under it and was badly injured.

E. G. Brown, of Plattsburg, Neb., has been appointed manager of the Lincoln Telephone & Telegraph Co., at Yutan, Neb.

Hall J. Brunner, manager of the Pacific Telephone & Telegraph Co., at Stockton, Cal., has resigned to accept a position with the Standard Oil Co.

Joseph B. Shields, of Lost Springs, Kan., for nine years president of the Kansas Mutual Telephone Association, also president of the Herington Co-Operative Telephone Exchange and of the Marion Mutual Switchboard Association, is a native of Pennsylvania. He was born in Orrstown on November 5, 1862, and received his education in the grade and high schools of that city.

Mr. Shields was reared on a farm and outside of teaching high school for about nine years, has been engaged in farming practically all of the time. His entrance into the telephone field was marked by the calling of a meeting at his home schoolhouse where the Ramona & Lost Springs Mutual Telephone Co. was organized, December 20, 1903. He has been president of that line ever since.

He helped organize the state association of mutual companies in Salina, February, 1907. He also assisted in the organization of lines into Marion and Herington during 1908 and 1909 and has been

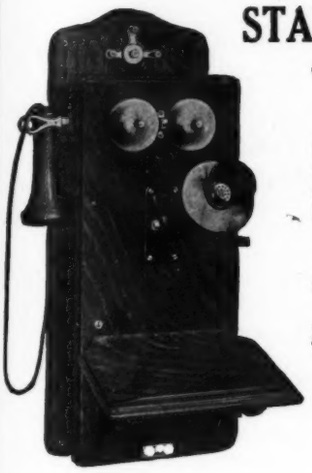
Joseph B. Shields.

instrumental in organizing and developing mutual telephone systems in various parts of the state.

Mr. Shields is a member of the Farmers' Union and several Hereford associations.

Highly Efficient New Telephones at Surprisingly Moderate Prices

STANDARD MAGNETO TELEPHONES



offer you the following valuable features:

Durability of Construction

The manufacturers have been in the telephone field for so many years that they know the rough usage which many instruments have to stand. Standard Telephones will stand hard knocks and still give service,

Excellence of Transmission and Signalling.

They satisfy the most exacting demands and fulfill every requirement.

When you buy a new Standard Instrument, you get the best and latest in Magneto Telephones.

Write for Prices and Particulars

PROMPT DELIVERY

STANDARD TELEPHONE REPAIR COMPANY — INDEPENDENT LOCAL AND LONG DISTANCE TELEPHONE — CHICAGO, ILL.

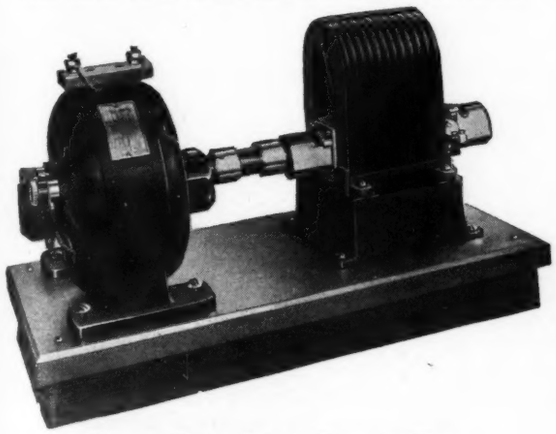
208 No. Fifth Ave.

J. SKINDERVIKEN, President

26 years in Independent Telephony

Buy a Holtzer-Cabot Magneto Ringing Motor Generator

AND RING YOUR SUBSCRIBERS WITHOUT BATTERIES



You will find it a Better Way

To begin with, the price of batteries has sky-rocketed.

Then again, run down batteries are the source of many troubles:

Operators complain that they "can't raise subscribers."

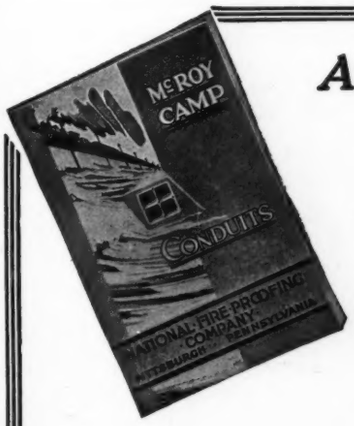
Subscribers complain about "poor service."

The manager spends much time tinkering with the worn-out batteries, and perhaps travels many miles to locate probable trouble in the phone itself—all to no purpose.

Provide yourself with a strong, continuous ringing current, by the purchase of our Magneto Ringing Motor-Generator.

The Holtzer-Cabot Electric Company

CHICAGO, ILL., and BOSTON, MASS.



Announcing a New Hand Book

on Underground Electrical Installations with

McRoy-Camp Conduits

A complete treatise on cable and glazed Conduit Construction

May we send you a copy?

NATIONAL FIRE PROOFING COMPANY

PITTSBURGH NEW YORK CHICAGO BOSTON

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

Frank L. Griffith, of Otis & Co., Columbus, Ohio, has been elected director of the Ohio State Telephone Co., to succeed F. F. Prentice, of Cleveland. Mr. Griffith will become a member of the executive committee and will have an active part in the company's affairs.

E. C. Bradley, until recently vice-president and general manager of the Pacific Telephone & Telegraph Co., of San Francisco, Cal., has been appointed assistant to the secretary of the interior.

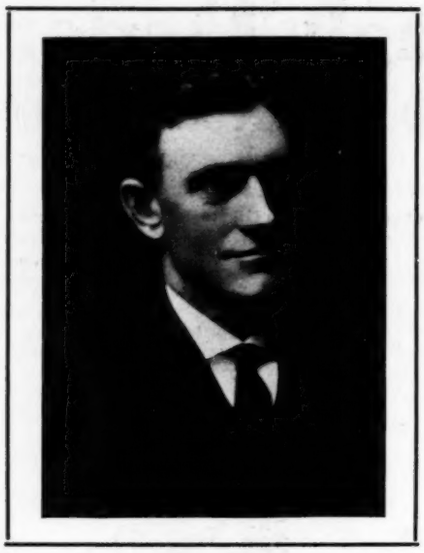
M. L. Saunders, local manager for the Michigan State Telephone Co., at Bay City, Mich., has been promoted to the management of the Jackson, Mich., district.

Harry E. Fitch, wire chief for the Michigan State Telephone Co., at Bay City, Mich., has been promoted to the position of manager of the local office.

George L. Stockwell, of Kansas City, has been made manager of the Home Telephone Co., at Scottsville, Kan.

Henry W. Wilson, proprietor and manager of the New Rockford Telephone Exchange, New Rockford, N. D., and president of the North Dakota Independent Telephone Association, is a Canadian by birth. He was born in Uxbridge, Ontario, December 25, 1872, and received his education in the grade and high schools of the city of New Market.

Moving to North Dakota in 1892, Mr. Wilson worked as a carpenter for about a year, when he then settled on a government claim. The next 11 years he spent farming in North Dakota. He was instrumental in having the first rural telephone line built in the neighborhood in which he was then farming and had the



Henry W. Wilson.

first rural telephone connected with the exchange at Wimbledon, N. D.

In 1904 Mr. Wilson purchased the New Rockford Telephone Exchange, with about 160 subscribers. Since that time the system has grown to approximately 600 subscribers, which is an excellent showing in a town of 1,600 population.

Mr. Wilson is a charter member of the North Dakota Independent Telephone Association and has attended every convention but one. During 1914 and 1915 he was vice-president of the association and in 1916 was elected to the presidency, in which capacity he is now serving.

Mr. Wilson is past master of Century Lodge No. 60, A. F. & A. M., past eminent commander of Zion Commandery No. 9 Knights Templar. He is at present a member of the city council of New Rockford.

Obituary.

Joseph Phineas Davis, for 25 years chief engineer of the American Telephone & Telegraph Co., died at his home in Yonkers, N. Y., on March 31, in his 80th year.

Mr. Davis was born at Northboro, Mass., and received his engineering training at the Rensselaer Polytechnic Institute, from which he was graduated in 1856. His first professional experience was gained on the construction of the Brooklyn waterworks. In 1861 he was appointed topographical engineer for the government of Peru, and remained in South America until 1865, when he returned to this country and engaged in the construction of city water works.

From 1873 to 1880 he was city engineer of Boston, and in the latter year was appointed chief engineer of the American Bell Telephone Co. This position he held until his retirement in 1905.

From Factory and Salesroom

Convention; Missouri, St. Louis, May 2-3; Southern States, Louisville, Ky, May 24-26

Stromberg-Carlson Silent Salesmen on Their Way.

Thirty thousand silent salesmen have been sent out to the trade by the Stromberg Carlson Telephone Mfg. Co., of Rochester, N. Y. These salesmen will cover the country from coast to coast. They will never return to the sender because they have been instructed to stay on the job and sell something or else die in the attempt.

These silent salesmen are not real flesh and blood traveling men but bulletins describing and illustrating a complete line of equipment required in the construction and maintenance of a local battery telephone system. This bulletin is along the same general lines as the farmer line bulletin No. 1009 sent out by the company last year, except that it consists of more pages and contains illustrations and descriptions of many pieces of new local battery apparatus which were developed during 1916.

If one of these silent salesmen has not reached your office you may get one started your way by dropping a line to the company's advertising department at Rochester, N. Y.

A Bit of Evolution.

By Claude L. Matthews.

A little over a year ago we advertised that for 30 days we would take any make of fault-finding instrument, whether a Telefault or the make of another manufacturer, or even a home-made instrument and give a credit on the purchase price of a type C Matthews Woodpecker Telefault, if after ten days' trial the customer decided to keep it. As a result we received several hundred of them.

In going over the pile it was noted that a number of type A Matthews Telefaults, and a larger number of other makes of sets that were designed to carry four batteries, had been cut down considerably in size by the men who used them. They had cut away all unnecessary bulk and weight. The battery chamber was sawed away, as was the compartment for the receiver and exploring coil. In fact they were "stripped to the bone."

Further investigation and interviews with the men who used them developed the fact that the troubleman has a considerable load to carry when fully ready for business and he doesn't want to be bothered with any more weight and bulk than necessary for him to get efficient results. While they liked the type C Matthews Telefault because it was more efficient, many of them thought that even it could be made smaller. They pointed out that, unless a company was not equipped with a good bridge outfit, they believed it would be better to leave out the resistance units, as they usually had the approximate location of the trouble determined for them by the wire chief with the bridge.

They also stated that most troublemen carry several batteries in their kits for various purposes and that in their opinion it would be unnecessary to have a battery compartment. In short, they wanted a fault-finding instrument that

USE UNIVERSAL BATTERIES

ON YOUR TELEPHONES

and be assured of Reliable Service

Highest Efficiency
Greatest Recuperation
Long Life
Fully Guaranteed

WRITE FOR PRICES, ETC.

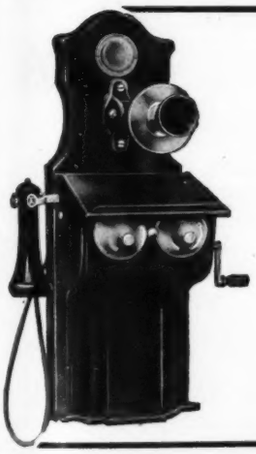
UNIVERSAL CARBON CO.
DUNDEE, ILLINOIS

Write for a copy of the ANDRAE CATALOG 34 AND BULLETIN 16

You should have a copy of this Catalog and Bulletin always available when you are in the market for telephone switchboards and supplies.

26 years of specialization in the telephone field qualifies us to satisfactorily fill your orders. The centralized proximity of our factory makes it a certainty that your orders will be filled on scheduled time. Write for Catalog and Bulletin today.

ANDRAE JULIUS ANDRAE & SONS CO. BROADWAY & MICH. STS. MILWAUKEE, WISCONSIN.
THE HOUSE THAT SATISFIES.



ERICSSON TELEPHONES

If you desire telephones of quality and high class appearance, standardize on the Ericsson line.

Forty years of experience behind our products.

An absolute guarantee that is a guarantee in the full sense of the word goes with each instrument. You money back if not satisfied.

Catalog sent on request

ERICSSON MFG. CO., TEL. DEPT.
45 NORTH DIVISION ST. BUFFALO, N. Y.

ESTABLISHED 30 YEARS

For Underground Equipment and Appliances

use the "Cope"

Cable Racks Conduit Rods
Bond Plates Bond Wire
Winches Capstans
Guard Rails Cable Reel Jacks
etc., etc.

Catalogue on request.

T. J. COPE, 1620 Chancellor Street, Philadelphia, Pa.

NEW YORK OFFICE:
114 Liberty Street.

REPRESENTATIVES:
The Electric Material Co., 589 Howard St., San Francisco, Cal.
Chas. Farnham, 207 I. W. Hellman Building, Los Angeles, Cal.

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

was compact as possible—that would weigh as little as possible—and that would be substantial enough to stand service conditions.

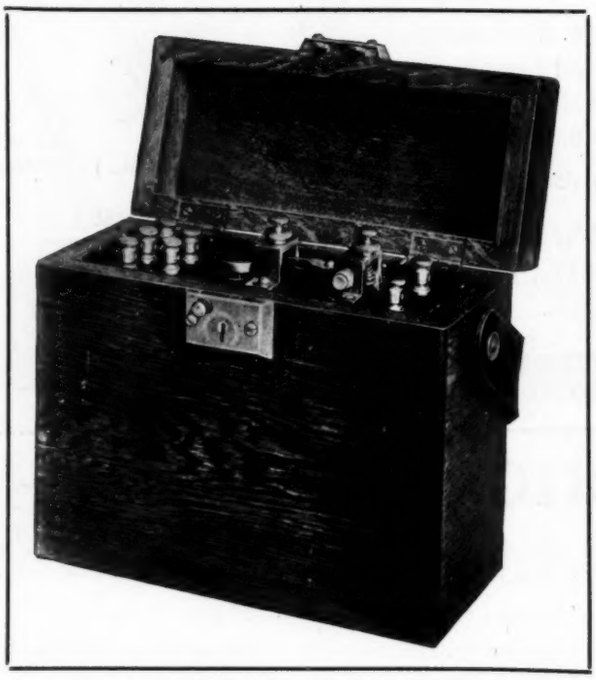
The result of this investigation and the suggestions received, was a determination to produce a Matthews Woodpecker Telefault that would satisfy this demand. The result is the type F Matthews Woodpecker Telefault.

It will find wet trouble of high or low resistance, dead shorts and all other faults in cable, except "opens." It contains a tone-test circuit that is more efficient than any other. It only requires one battery to operate it, although several can be used if desired. It is absolutely impossible to confuse its tone with anything but the tapping of a woodpecker. Only four volts are sent out on the line. Therefore the tone can't possibly affect any working pairs that may be in the cable.

The exploring coil and receiver are the same as those furnished with the type C, 50 per cent. more sensitive than any other coil. The box is designed to contain the exploring coil, receiver and cord connecting them. The size of the box has been greatly reduced.

The type A Matthews Telefault and most other fault-finding instruments had a bulk of 724 cubic inches and a weight of 26 pounds, against a bulk of 187 cubic inches and a weight of 7 pounds for the type F Matthews Woodpecker Telefault. The type F also weighs 11 pounds less than the type C and has a bulk of 257 cubic inches less.

The type F Matthews Woodpecker Telefault is built of heavy quartered-sawed oak, so that it will stand real service. It was designed by a troubleman for troublemen and to meet a demand. It will be shipped anywhere in the United States on ten days' trial, prepaid.



The Type F Matthews Woodpecker Telefault.

Saving Labor on Pole Holes.

By J. B. Stoneking.

Present day conditions of labor shortage and costs and the extreme difficulty of organizing and keeping good efficient telephone and electric light pole line construction gangs have caused considerable delay in the work, and, in many cases an absolute curtailment of construction work on line extensions. Engineers and contractors on this class of work have been endeavoring to perfect mechanical and other saving devices to overcome this deficiency in labor.

Many machines for digging pole holes have been worked out and are meeting with a certain measure of success. Generally speaking, these machines have limitations and certain weaknesses to be overcome before they will give unqualified and satisfactory service. A machine that will give excellent results in a certain sized hole in a given type of soil will fail utterly when required to face other conditions.

The range of various conditions which such a device must meet, its portability, ease, cost of operation and maintenance, amount of work to be done, and the first cost of the machine, are the governing factors to be considered. Up to the present, these qualifications have not been successfully met and combined in any single machine.

Where poles must be set in rock, dynamite has long been used as the only successful method of making holes, and this method is being quite largely adopted by contractors and construction foremen for nearly all sorts of soils except in easily-worked sand and loam. The use of explosives for making pole holes in material other than rock has grown slowly, due to the fact that labor was plentiful and cheap, good results were not always obtained by unexperienced loading of the dynamite, and many engineers contended on the theory that the ground would be so loosened as to make firm tamping of the earth around the butt of the pole impossible.

My attention was first called to the practicability of the dynamite method of hole digging by an old miner on some telephone line construction in Montana, where the men were paid a certain sum per hole. The soil was a clay loam slightly moist, but firm enough to require barring in digging the material. A bar was driven 30 inches into the ground to make a hole for the dynamite, from one-fourth to one-half pound of which was used per pole, generally without tamping. In some cases, in more compact material, a short plug of wet clay was used.

A bridge of earth was left over the cavity formed by the explosion, but a few blows with a shovel caved this in and the debris was removed from the bottom. A good hole from ten to 14 inches in diameter and from 3 to 3½ feet deep, when cleaned, was obtained, the sides and bottom being well compacted. The miner was enabled by this means to complete nearly twice as many holes per day as any other man in the digging crew.

Later trials in different soils have shown that what is a good loading practice for one condition does not always hold true for others, and it is necessary to shoot a few holes in order to arrive at a correct loading.

Better results have been obtained by removing the top earth to a depth of several inches and to the diameter of the port hole desired, before making the bore hole for the dynamite. This has the effect of relieving the pressure and diminishing the formation of the bridge over the cavity. In making the holes for the dynamite, a punch bar driven by hammers, a soil auger with a long handle, or a churn drill are generally used. One large telephone company uses a specially-made hollow pipe drill that is churned up and down, doing very effective work in clay soils, enough water being used to make a thin mud.

For deeper work up to 6½ feet, very good holes are made by tying small pieces of from one-eighth to one-half cartridge to a small straight lath or stick, starting at the bottom end and spacing them about 6 to 12 inches apart, leaving the last piece about 18 to 20 inches below the top of the ground.

This distributes the dynamite charge along the entire hole and packs the earth tightly against the sides, leaving a cavity from 12 to 18 inches in diameter.

Sometimes the dynamite is inserted into a long roll or cylinder of heavy stiff paper and held in place by sticking pins through it, or by cutting short sticks the length it is desired to space the cartridges apart and dropping them alternately into the hole with the cartridges.

When this is done, care should always be taken not to allow earth to fall into and close the hole between the cartridges, for this has a tendency to break the detonating wave from one cartridge of dynamite to another, and may result in misfires.

Ordinarily no tamping is necessary, but

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Western and Northern Cedar
THE LINDSLEY BROTHERS CO.
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General Sales Offices 832-834, 72 W. Adams St. Chicago, Ill.
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Genuine Cedar Poles
Southern White Cedar
(*Chamaecyparis Thyoides*)
U. S. Dept.—Agriculture—Forestry Dept.
All Sizes—Prompt Service
SOUTHERN EXCHANGE CO. 97 Warren Street NEW YORK

NORTHERN-WESTERN
CEDAR POLES
A FULL ASSORTMENT OF SIZES
PROMPT SHIPMENTS ASSURED
T. M. PARTRIDGE LUMBER COMPANY
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PLAIN OR BUTT TREATED
WESTERN RED CEDAR POLES
Quick Shipments
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SPOKANE - - WASHINGTON
(Formerly Northern Mercantile Co., Ltd., of Sandpoint, Idaho)

CEDAR POLES
NORTHERN or WESTERN
Plain or Butt Treated
THE VALENTINE-CLARK COMPANY,
Toledo — Chicago — MINNEAPOLIS, MINN. — St. Maries, Idaho

"NAUGLE" POLES
Plain or Butt Treated. Largest Stocks.
READY FOR IMMEDIATE SHIPMENT
NAUGLE POLE & TIE CO.
Main Office: 59 E. Madison St. CHICAGO

W. C. STERLING & SON CO.
POLES OF STERLING QUALITY
Oldest Cedar Pole Firm in Business
MICHIGAN and WESTERN CEDAR
W. C. STERLING & SON COMPANY
1880 — Monroe Michigan — 1917

Duluth Log Company
POLE SERVICE
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NORTHERN COAST TIMBER COMPANY
RED CEDAR POLES
TACOMA WASH.

CEDAR POLES Send for Prices, Prompt Shipments from Wisconsin or Chicago Switching District Yard on I. H. Belt R. R.
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"LASTLONGER BRAND" WESTERN CEDAR POLES
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CEDAR POLES
HALL L. BROOKS ::: TOMAHAWK, WIS.

THE UNIVERSAL PUSH BUTTON

is just the thing for your desk, door bell, buzzer, transmitter cut-out, or any place you have the need of a push button because you don't have to fumble around to find it. The entire top is movable so when it is pressed at any point the contact is made.

¶ The cut is actual size. The button shell is finished in beautiful black enamel, and the top is a black composition, making a neat and attractive article. If you have an electric horn on your car this button will enable you to operate it more easily.

This button is used by a number of the large Telephone Companies as standard equipment.

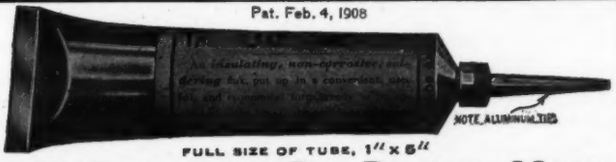
PRICE 25 CENTS. Liberal Discounts on Quantities.
THE GARFORD MFG. CO., Elyria, Ohio, U. S. A.

Why Sell to Us?
Because we pay the highest prices for *Obsolete Telephone Equipment* and *Scrap Platinum.*
The Mutual Smelting & Refining Co.
114 No. Front Street - - - COLUMBUS, OHIO

Don't take anyone's word for it. Try the
Wireless Cable Tester
in comparison with any other make, then consider the price and decide for yourself. We ship on trial.
ELECTRIC SPECIALTY MFG. CO., Cedar Rapids, Iowa

Insulated Staples
4 Sizes
Pat. Nov., 1900

BLAKE Specialties
STAPLES best for wiring.
TUBE FLUX best Flux for soldering.



FULL SIZE OF TUBE, 1" x 6"

Blake Signal & Mfg. Co., Write for Samples 251 Causeway St., Boston, Mass.

for harder material a small amount of tamping has the effect of confining the gases formed in the explosion and forcing them to do more work laterally. Tamping generally leaves a bridge over the cavity. By varying the size of the cartridges, the spacing apart along the hole, and the amount of tamping in a few trial holes, the engineer is able to obtain a system of loading to fit almost any condition.

For a pole line constructed through a district where the soil was hard clay, very slightly moist, the following loading gave excellent results for 4½ foot holes: ⅛ cartridge in bottom; ⅛ cartridge 12 inches above; and ⅛ cartridge 12 inches farther up; no tamping.

In another section, the soil was a heavy, plastic, water-saturated clay and holes 6 feet deep were wanted for large poles. The best loading in this case was found to be seven ¼ cartridges spaced six inches apart.

In general, the quicker-acting dynamites make better holes than the slower acting, heaving grades, a 40 per cent. to 50 per cent., straight grade being used in summer and a 40 per cent. to 60 per cent. low-freezing extra being used in winter when there is some liability of the dynamite becoming chilled or frozen.

Due to the wide adaptability and elasticity of this method of digging holes, the quickness, absence of high first cost for equipment and overhead charges for maintenance, and low cost per hole, as compared to hand labor, it has met with much favor by engineers and contractors who have given it a thorough trial.

Stromberg-Carlson Blotter Calendar for April.

Phoney Bill, as shown in the accompanying reproduction from the April blotter calendar of the Stromberg-Carlson Telephone Mfg. Co., has joined the home guard as an auxiliary to the police force. What cares he for April showers, for he knows that the Stromberg-Carlson No. 890 water-tight police telephone is always ready for service, regardless of weather conditions.

Phoney Bill on Home Guard Duty.

Connecting Small Storage Batteries for Charging Purposes.

It happens quite often that a telephone company has need to charge a number of small portable storage batteries. Sometimes it is desired to charge these portable batteries, which may be used for lighting and starting purposes in an automobile, without removing them from their location.

As an aid in charging them, the Universal test clip is especially adaptable. They may be attached to the connecting cords and all that is necessary is to snap them over the battery terminals. No time is lost in cleaning dirty terminals, for the teeth bite through the corrosion and make a good contact. Where it is desired to charge a number of storage cells in series, the Universal test clips may be placed on the ends of pieces of flexible cord or cable and the jumpers thus obtained used to connect the battery cells by snapping the clips over the lugs.

The Spread of Jaws.

The No. 21-A Universal test clip, which is shown in the accompanying illustrations, has a capacity of 35 amperes. It is made of steel and is lead plated, so that it may be used over and over again. As shown in one illustration, the spread of the jaws of this test clip is one and a half inches. Other test clips have a spread of jaws of three-quarters of an inch and a capacity of 15 amperes, and are provided with rubber insulators which entirely cover the clip with the exception of the jaws.

In case a clip of an extra large capacity is desired, one is provided having a capacity of 100 amperes which may be used for short tests on circuits carrying from two to three hundred amperes. This clip is made of copper and is lead plated, the spread of its jaws being one inch. These clips are manufactured and sold by R. S. Muller & Co., Cleveland, Ohio. Further information will be sent upon request.

The No. 21 Universal Test Clips.

Paragraphs.

THE CROUSE-HINDS CO., of Syracuse, N. Y., has just issued an attractive little eight-page folder descriptive and illustrative of the Harpoon guy anchor, copies of which may be obtained upon request.

ERNST & ERNST, of Chicago, public utility accountants, have removed their Chicago offices from the First National Bank building to suite 1038 to 1050 in the Continental & Commercial Bank building.

THE M. W. DUNTON CO., of Providence, R. I., has just issued a nine-month calendar which begins with the month of April. It, of course, is a booster for Nokorode soldering paste and salts. In addition to the calendar each sheet contains clever advertisements which strikingly illustrate the Nokorode virtues. Attention is directed to the company's offer of $1 in cash for soldering suggestions which are suitable for publication in "Soldering Kinks." If any company has been overlooked in the mailing of these calendars, a copy will be promptly sent upon request.

CHRISTOPHER F. WALL, JR., was recently appointed general manager of the National Electric Specialty Co., of Toledo, Ohio, to succeed P. H. Chapman, who has entered the firm of Barker, Frost and Chapman, insurance brokers of that city. Mr. Wall was formerly connected with the sales organization of the Willys-Overland Co.